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CONTENTS.

	PAGE
Circular to Gas Companies	29
Parliamentary Intelligence:—	
Committee on the Nottingham Gas Bill	31
Ditto on the Hartlepool Gas and Water Works Bill	38
Ditto on the Great Central Gas Consumers Bill	38
The Electric Light	53
Specific Gravity Apparatus	53
Miscellaneous News:—	
The Electric Light	53
Artificial Light	53
Bedford County Prison	53
Vulcanized Indiarubber	53
Share List of Gas Companies	54
Price Current of Articles used in Gas Works	56

TO CORRESPONDENTS.

A PROPRIETOR OF GASWORKS *is informed that we do not hold ourselves responsible for any of the opinions promulgated in this paper, except those expressed under the head of "Circular to Gas Companies." Our duty, as impartial journalists, is to insert all articles sent to us which are couched in fair and reasonable terms; and, if he will favour us with his views on the particular article to which he refers, we shall have pleasure in inserting it.*

A SUBSCRIBER (Glastonbury) *will find the formula for the calculations he requires accurately given in "Clegg's Treatise on Gas Lighting," published by Weale, Holborn.*

A GAS CONSUMER (Colchester) *will find his questions answered in the report of the evidence given on the "Great Central Consumers' Gas Bill," in our present number.*

W. F. (Brighton) *must be unaccustomed to experiments upon the illuminating power of gas. The very able superintendent of the Black Rock Station will, we have no doubt, have great pleasure in instructing him on this subject.*

ERRATA.

In page 23 of a portion of our last impression two errata escaped our observation, the expenses of distilling a ton of coal having been printed £1. 8s. instead of £1. 0s. 8d., and the presumed profits, as quoted from the *Morning Advertiser*, being stated as £2. 9s. 8d. instead of £2. 12s. 4½d. Both these errors were corrected in the latter part of the impression.

NOTICES.

We have anticipated, by a month, the publication of our next quarterly number, in consequence of the importance of the parliamentary intelligence, of which we give a very ample report. The same cause compels us to postpone the review of Mr. Penfold's publication on the Rating of Gasworks, &c., and other important communications which have reached us. Our future quarterly numbers will be issued in July, October, January, and April.

No extra charge is made to subscribers for the increased size of the present number.

All communications relative to the editing of the JOURNAL OF GAS LIGHTING, and orders for Advertisements, to be addressed to the Editor and Proprietor, THOMAS G. BARLOW, Civil Engineer, 32, Bucklersbury, London; and any persons who are desirous of receiving the publication regularly are requested to give orders to that effect to their Booksellers or News Agents; or to William Strange, 21, Paternoster-row, London.

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15 per cent. discount for 3 insertions.
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The Editor will be particularly obliged by his friends forwarding to him Notices of all Meetings, Trials, or Appeals which it may be interesting to the Gas World to have reported.

Circular to Gas Companies.

The parliamentary session of 1849 seems destined to exercise as important an influence over the future progress of gas-lighting as did that of 1825. The latter gave stability and an impulse to the nascent art, and the former promises to correct many of the popular errors and prejudices into which the public have fallen, and to establish certain economical first principles, the neglect of which, in the origin, has been the cause of much dissatisfaction on the part of the private consumer of gas, and injury to the owners of gas property. We allude particularly to the opinions prevailing among parties of the class of the writer in the *Morning Advertiser*, and speakers at public meetings of gas consumers, who maintain that gas costs less than nothing, by profit realized on the sale of the residuary products. Such persons must now see that it is an article costly in its manufacture and expensive in its distribution. Another fallacy may now be considered as exploded, viz., that of supplying the public lamps at less than cost price, the difference being compensated for by an extra charge on the private consumer. On this head none of the parties who have appeared in Parliament during this session, whether representing private consumers, lighting commissioners, or others, seeking to impose restrictions on old companies or to incorporate new ones, have ventured to suggest an excuse, nor have any hinted that a less profit than ten per cent. was a sufficient remuneration for capital judiciously applied and invested in this branch of industry. Every witness hitherto examined before the parliamentary committee (of the proceedings of which we give a very ample report) has confirmed these opinions, and the committee sitting on the gas bills of the session has itself ratified them with the seal of their approbation.

The opposition made to the application of the Nottingham Gas Company for power to raise additional capital (having expended all they were authorized to raise by their several previous acts) is peculiarly instructiveto our provincial readers. The opposition came, on the one hand, from the gas consumers; and, on the other, from the lighting commissioners, both being represented by the same parties; the former being desirous of introducing a clause fixing a maximum rate of 4s. 6d. per 1000 feet, and the latter requiring the company to continue the lighting of the public lamps at the present rate of 1s. 9d. per 1000 feet for lights in the town, and 2s. 9d. for those in the out districts. Both these clauses the committee rejected, substituting the following, which stands as clause 18 in the act, as it has passed the Commons:—

"And be it enacted that, from and after the expiration of any existing contract for the supply of gas to any public lamps within the limits of this act, the company shall afford such supply from any main situate within 25 yards of any such lamp, at a price equal to the lowest price charged for the time being by the company to any private consumer."

The effect of this clause will be to cause a large reduction in the price to the private consumer at the termination of existing contract for public lights, as the company is limited to a dividend of 10 per cent., and stringent powers are given to the public authorities for compelling a reduction in price when the profits exceed this rate.

By clause 20 the company are empowered to let meters and fittings on hire, and protection is given against seizure for rent or debt. It is to the following effect:—

"And be it enacted that the company may let for hire any meter for ascertaining the quantity of gas consumed or supplied, and any fittings for the gas, for such remuneration in money as shall be agreed upon between the company and any person to whom the same may be so let, and such remuneration shall be recoverable in the same manner as the rents or sums due to the company for gas; and such meters and fittings shall not be subject to distress for

rent of the premises where the same may be used, nor to be taken in execution under any process of a court of law or equity, or any fiat in bankruptcy against the person in whose possession the same may be.

Clauses 24 and 25 empower the authorities to appoint an inspector of meters; the consumer requiring an examination of his metre being bound to deposit in the hands of the inspector any sum due to him by the company:—

"And be it enacted that the recorder of the borough of Nottingham shall appoint an inspector of meters, which he is hereby authorized to do, and such inspector shall have at all times, on the application and at the expense of any consumer, a right to inspect the meters erected by the said company in the premises of the person making such request, after giving 48 hours' notice of such intended inspection to the said company or their clerk.

"Provided always and be it enacted that before such inspection the person requiring such examination shall deposit in the hands of the inspector all money due, or appearing to be due, by such person to the company; and, in case such consumer shall have paid any sum in excess, such excess shall be returned to such consumer."

Upon the whole we highly approve of all the decisions of the committee, and feel that they have been guided by a sound judgment and right discretion in dealing with the various points raised before them.

The case of the Great Central Consumers' Gas Company has been only part heard, and is adjourned for six weeks, to allow the promoters time to give fresh notices, without which their proposed works must have been built within the confines of the City, in the event of their bill being granted. The material facts of the case are, however, now before the public, as disclosed in the opening address of their counsel, and in the evidence of the principal witnesses. On three points we can, however, venture to say, upon authority, that the bases upon which the superstructure is built are incorrect. We allude to the relative proportion of public to private lighting, the amount of income derived from each source, and the length of mains required to be laid. The gross rental is calculated at £150,000 per annum, which exceeds by 25 per cent. the actual return, and the relative proportion of gas consumed by the public lights is one-fifth instead of being one-tenth part of the whole. The amount of rental stated in the evidence is acknowledged to be a guess, and because it has not been hitherto contradicted it is assumed to have been an admitted fact.

The evidence of Mr. Croll, the principal witness, is relied upon for establishing the cost price of gas, and the following are the principles upon which his estimate is made:—

That one-fifth of all the coke made will suffice as fuel for heating the retorts, including getting up heats and letting them down, scurfing, &c., and providing fuel for engine, offices, &c.

That the cost of labour and wages of all description, exclusive of lamplighting, will not exceed 3½d. per 1000 feet.

That each 15 inch round clay retort of 8 feet 6 inches long, and each 12½ D iron retort 7 feet 6 inches long, will produce 4000 feet of gas in twenty-four hours.

That the wear and tear of retorts will not exceed 2d. per 1000 feet.

That the cost of materials for purification will be ¼d. per 1000 feet.

That the wear and tear of works and main will not exceed 2d. per 1000 feet.

That the expenses of distribution, including lighting and repairing lamps, collections, bad debts, rates and taxes, law expenses, stationery and incidental expenses, directors, engineers, secretary, clerks and inspectors, maintenance of works, and wear and tear of meters, will be 8·71d. per 1000 feet on an annual make of 368 million feet, and 6·07d. on double that quantity.

And, lastly, that the company will receive money for five-sixths of all the gas made.

To render these figures intelligible to such of our readers as do not enjoy the advantages of a station-meter upon their works, we have reduced them to the cost per ton of coals used per annum, from which they will readily see how far these estimates agree with their practice:—

Per Ton of Coals.	s.	d.
All labour, excepting lamplighting.....	2	8·2
Wear and tear of retorts	1	6·4
Materials for purification	0	2·3
Wear and tear of works and mains.....	1	6·4
Expenses of distribution on 368 million feet	6	8·13
" " 736 "	4	7·84

Mr. Croll further states that the capital required for erecting and carrying on a gaswork in London capable of distilling 40,000 tons of coal per annum is a little more than £160,000, at £4 for each ton of coal used per annum, and for 80,000 tons £250,000, or £3. 2s. 6d. per ton.

We reserve the observations we have to make upon these estimates till the further evidence in their support is before us, as we are promised practical confirmation of them from other witnesses.

The learned counsel for the promoters in his opening speech indulged in some very harmless criticisms upon the "Letter to the Earl of Carlisle on the cost and supply of gas in the metropolis," to which we alluded in our last number. We are assured that none of the metropolitan gas companies were cognizant of this production till it appeared in print; and though some of its details may not exactly coincide with the experience of each individual company, yet that the main facts are sufficiently correctly stated to have induced them to patronize the publication. The writer's object appears to us to have been the promotion of his scheme for the amalgamation of the metropolitan gas companies much more than the rejection of any other particular scheme for obtaining a reduction in the price of gas.

The learned counsel signalled out for his ridicule the allowance of 1½d. per 1000 feet made in the estimate for directors' remuneration, and 3d. for lighting, cleaning, and repairing public lamps and services. Now, his own allowance for directors was £2000 per annum; and even allowing that a new company obtains the supply of the public lamps, and one-third of the private consumption of the city of London, it will amount to a total of only 220 milllion feet, or 2·18d. per 1000 feet, being ·43d. more than the estimate he affects to criticise. Again, as to the public lighting, there are 40,000 public lamps in the metropolis, the cost of lighting, cleaning, and repairing which, the writer estimates at £1 per lamp, or £40,000 per annum, and the total quantity of gas made being 3200 million feet, gives exactly 3d. per 1000 feet as the cost of lighting, cleaning, and repairing the public lamps. Mr. Croll calls the cost per lamp in the City 15s., but in many of the out-districts it is much more, and the service pipes, cocks, and burners have to be repaired at the expense of the gas companies, for which he has made no allowance. The great error committed by the learned gentleman in the observations he made consists in supposing that the author intended any of the estimates or calculations given to apply to the city of London alone; it is clearly stated that such is not the case, and any attempts to found an argument against, or throw discredit upon, the views of a writer, by perverting the sense in which the remarks are made, fall harmless to the ground. The case, so far as it has yet proceeded, has been conducted with great talent and good feeling on both sides, and we trust the same will be continued to the close, and that the public will suspend their judgment on the *ex parte* evidence now before them.

The report of the inspector of the Metropolitan Fire Brigade for the year 1848 contains the following abstract of accidents having their origin from gas, and accompanies with a few observations which we transcribe:—

27	houses	totally destroyed.
269	do.	seriously damaged.
509	do.	slightly damaged.
805.	Of these:—	
39	caused by	escape of gas from defective fittings.
7	do.	accidents in lighting gas.
15	do.	gas being left burning too high.
1	do.	gas stove.
62		

"From the foregoing it will be seen that the safest of all light, 'gas,' has been productive of considerable mischief. In addition to the fatal accident in Albany-street, which I have fully noticed, numerous other explosions, attended with considerable personal injury and the destruction of much property, have occurred within the last twelve months in the metropolis. As gas fittings become dilapidated by age, great attention is required to guard against the occurrences of accident; unfortunately, however, we find quite as many accidents take place with new fittings as with old. There is no rule without an exception, and some gasfitters are very intelligent, well-informed men, but the majority of them are very far below the mark. At a recent inquest, after a fatal fire, a shopkeeper stated that gas escaped through a screwhole in the counter. Upon sending for his gasfitter, he said, "Oh, put a bit of putty into it." The consequence of the puttying process appears to have been, that the gas which escaped through the counter accumulated beneath, and, being ignited by a light taken into the shop by a child, caused the destruction of the premises and the death of two persons."

The use of iron tubing in preference to tin or other metallic pipe for interior fittings would be a great preservation against accidents of this nature. In Hamburg no tubing but iron alone is allowed to be used.

We note considerable flatness in the metal market, and a reduction of prices in most branches of these trades. Manufacturers generally complain of great want of orders, much of which they attribute to the disinclination of gas companies to extend their works, while such uncertainty hangs over their future progress and welfare. For our part we are rather inclined to look to the early-closing movement as operating prejudicially on the prospective demand for gas, and that another year must elapse before many of the works have recovered what they have lately lost in this respect.

Parliamentary Intelligence.

COMMITTEE ON GAS BILLS.—MARCH 13.

Mr. Ker Seymer, chairman; Mr. Pole Carew, Captain Boldero, Mr. W. Brown, and Mr. Somers Cocks.

Nottingham Gas Bill.—The object of this bill is to enable the Nottingham Gas Company to create an additional capital of £40,000, to be raised by sale of shares at public auction, and to give the company the power of borrowing a sum of £28,000 by loans.

Mr. Sergeant Wrangham, Mr. Hope, and another, appeared on behalf of the company. Mr. Hill, Q.C., Mr. Merewether, and another, appeared on behalf of the petitioners against the bill, who were the Municipal Corporation of Nottingham, the lighting committee of that town, and a number of the burgesses.

Mr. Sergeant Wrangham stated the case for the Nottingham Gas Company. After briefly describing the early history of the company, which was formed in 1818, with a capital of £16,000, and power to borrow £5000 additional, he said, in 1842 the company was amalgamated with a rival company, projected three or four years before, and the joint capital was raised to £40,000, and the borrowing power to £13,000. That sum, however, had been found insufficient for the operations of the united company, and by the act of 1818, constituting the company, the dividends were limited to ten per cent., the shareholders being entitled to supply any deficiency of one year by the surplus profits of another, and on the amalgamation those deficiencies amounted to £14,000. In consequence of the capital being raised from £16,000 to £40,000, 4800 new shares were created, but of these 2800 had to be applied in the way described, leaving only 2000 applicable to the operations of the company. That sum of £10,000 was speedily absorbed, owing to the rapid increase of the consumption of gas rendering new works, &c., necessary, and, therefore, a sum of £2,500 was borrowed, lessening the borrowing power to £3000. Under the act, however, the sum borrowed was converted into shares, which, being then at a premium of 100 per cent., produced £5000, although the nominal capital was only increased by £2500. The learned sergeant then proceeded to show that there was an urgent necessity for an increased capital, owing to the increasing size and wants of the town, which formed the centre of the manufacturing population of the district. Immediately adjacent to the town was a large extent of common or lammas land, for the enclosure of which an act had been obtained a few years ago. Previous to the passing of that act the existence of the common rights had prevented any building on it, and, the population increasing beyond the means of locating them in the town, extensive suburbs had sprung up in the neighbourhood, at Radford, Lenton, and other places. The supplying of those places with gas had absorbed a large portion of the company's funds, rendering necessary the present application to Parliament. Plans had also been laid out for building on the intervening common land, and to avoid the necessity of another application they had determined on asking for a sum sufficient, it was calculated, to enable the company to carry on its operations for 13 or 14 years. The sum applied for was £40,000 in new shares, and £28,000 to be raised on loans. The learned sergeant then entered on a review of the objections raised by the petitioners to the bill. One petition, he observed, was from the lighting committee, a body at present under a contract with the company for ten years, of which four or five were yet unexpired, by which the company agreed to light a certain proportion of the town lamps at £2 each per annum, being at the rate of 1s. 9d. per 1000 cubic feet, and the more distant at £3 each per annum, or 2s. 10d. per 1000 cubic feet, both being far below a remunerating price. He thought it came from the lighting committee with a very bad grace that they should oppose the attempt of the company to extend its business and seek that profit elsewhere which they took care it should not obtain from the town lamps, they having taken the benefit of the extinction by that contract of a debt of £1400 or £1500. The only material objection made by the corporation to this bill was as to the mode in which it was proposed to raise the new capital, namely, by issuing new shares at par to the existing shareholders. To that mode the corporation objected, on the ground that, as the shares were at cent. per cent. premium, the required sum of £40,000 would be raised by a nominal capital of £20,000 if the shares were sold by public auction. On the merits of the question, however, he need not enter, as there was no objection on the part of the company to such an alteration of the bill as would compel them to sell the new shares by public auction. The corporation also complained of the prices charged for gas by the company as too high, and said they ought to be reduced. They also complained of the quality. That, however, was a question of fancy; and they would hear from the witnesses he should call that the price of gas in Nottingham was as low as in any of the towns of the midland districts, and that the quality was the best practicable, while, though not compellable by law, the company had actually reduced the prices three times since 1842. In 1844 the prices ranged from 6s. 8d. to 5s. 5d. per 1000 cubic feet, in proportion to the quantity consumed, the minimum being charged to large consumers, from whom the expense of collection was small, and the maximum on the small consumers; in that year the range was reduced to from 5s. 5d. to 4s. 4d.; and in 1847 the range was again lowered to from 4s. 4d. to 4s. 2d.; a further reduction would have been made this year but for the expense caused by the opposition to this bill. Something he was aware would be said about a reserve fund, which the act of Parliament enjoined the company to form from the surplus profits, to be applied to extensions and improvements, but the fact was that, although such a fund had not been nominally created, still all its purposes had been fulfilled, as the surplus of profits had been applied directly to such purposes. The next point was the question of a maximum price, which the petitioners wished to be fixed at 4s. 6d. per 1000 cubic feet; to that, however, the company objected, as it was required neither by the justice nor necessity of the case, and the consequence would be that that maximum price would be charged on all consumers indifferently. In point of fact, moreover, there practically was already a limit, for as the company could not make a greater dividend than 10 per cent. on their capital, if the profits ever exceeded that amount, and there be capital sufficient for constructing new works, the surplus must necessarily go to the reduction of the rate, as even a gas company would not throw money in the dirt; and of the readiness of the company so to act they had proof, as the prices had already been reduced three times. It was then demanded that the consumer should be allowed to put up his own meter, which the company would not at present allow; but he would ask whether any company could be expected to permit a man to put up a meter of his own selection, which might be so constructed as to register less than the quantity actually consumed? It was said the consumer might equally object to the company's meter on a similar ground; but, even setting aside the absurdity that a great public company would perpetrate so mean a trick, the consumer was now allowed the fullest liberty of inspecting the meters to be put up. The last ground of objection was that the bill did not contain a provision compelling the company to supply gas on demand. Such a provision would be most unreasonable. He was not aware of any case where gas had been refused by the company, but he could easily imagine such a case, as, for instance, where an individual wanting a small supply of gas living in such a neighbourhood or at such a distance as to render the cost of laying down pipes, &c., so great as to cause a loss instead of a profit—a loss that would ultimately fall on the public, who would be compelled to pay a higher price. To introduce any such clause would create a highly inexpedient precedent. Those he believed were the principal objections to the bill, which he believed he had shown to be utterly groundless, and he thought he had stated sufficient grounds for agreeing to the preamble of the bill.

The first witness called was

Mr. Hawkesley, engineer to the Nottingham Gas Company.—He was examined by Mr. Hope, and, in answer to interrogatories from that learned gentleman, stated he had been engineer of that company for ten years, and had previously been consulted by numerous gas companies in Glasgow and Dundee, also in Wolverhampton, Ashton, and other places in the midland counties. The witness then at some length detailed the position and resources of the company previous to and subsequent to the amalgamation in 1842, the statement being substantially the same as that made by Mr. Sergeant Wrangham in his opening address. With regard to the company's present position, their capital was £42,500, and the bond debt was £7400; they had power to borrow £3100, but there were two sums owing for land purchased or in treaty for, amounting to £2900, leaving a balance of only £200 to go on with. It was most necessary that a speedy provision should be made for an extension of their works, to enable them to meet the growing demand for a supply of gas. That demand had within the last few years increased in a very rapid manner, as a proof of which he mentioned that one new work had been erected only eighteen months ago, and it was already half occupied. He had no doubt a very large increased supply would be called for by the erections going on in the enclosed common land, a number of streets round being marked out and many completed; and if it were only for police purposes the new quarter would have to be lighted, as otherwise it would be infested with thieves and bad characters, of which there were too many in the district. Now, the company wanted a sum for the extension of their works in these new streets, exclusive of laying down mains, amounting of itself to £13,400. As regards the rest of the district he could say, speaking from a long experience of other manufacturing towns similarly circumstanced, that, if Nottingham went on increasing as it had done for the last 14 or 15 years, there would be required on an average a constant annual addition of 5 per cent. to the existing capital for works to enable the company to supply the quantity of gas that would be required. In other words, the capital would have to be doubled every 14 years. The Nottingham Gas Company had already expended a sum of £60,000 in works, and in the course of another 14 years he could confidently calculate that another £60,000 would be wanted. The capital proposed to be raised by this bill was therefore not exorbitant, and if reduced they would be compelled at an early period to make another application at great expense and much trouble. No injury or evil could possibly result to the inhabitants of Nottingham from this extension; on the contrary, they would be benefited by the more general diffusion of gas and the reduction of price that would take place. Objection had been raised to the quality of the gas supplied. They were, however, compelled to use midland coal, which was brought from a distance of only 20 miles, and from which they got as good a gas as it was possible to extract. The quality was equal to that of the neighbouring towns, which, he believed, were all obliged to use the same species of coal. The illuminating power of their gas was equal to 14 or 15 candles, with a consumption of 5 cubic feet per hour. It was perfectly

pure, containing no sulphuretted hydrogen, and they never had had any complaint on that score, except on one occasion, when, owing to an accident, a valve was broken, and sulphuretted hydrogen was admitted. The only alternative in such a case, if they wished to obviate the effect such an accident would have in causing the gas to burn dim, would be to empty the gasometer; that would, however, be difficult, as the gasometer contained several days' manufacture, and if it were emptied the town would be left in darkness until it were refilled. As to what had been said about the quantity, he could positively state that it was quite equal to the demand. Their usual stock in hand, after twelve o'clock at night, was 100,000 cubic feet. With regard to pressure there were no complaints except from two parts of the town, in which the gas was weaker than in other portions, because the consumption increased to an extent beyond what the pipes could supply, but those parts were about to be relaid with larger pipes. They had erected a new work at Radford, but there they only used dry lime, wet lime only being adapted for large works. In the middle of winter they manufactured 300,000 cubic feet a day. The witness was then examined as to the price at which the gas was sold. The present prices were on a graduated scale, ranging from 5s. 5d. per 1000 cubic feet for the smallest consumption to 4s. 2d. on the largest. The Midland Counties Railway Company, the largest consumers they had, paid 4s. 4½d. during the last quarter. Mr. Hawkseley then entered into details respecting the reductions made in the range of prices at various times since 1844, proving the statement made by the learned sergeant in his preliminary statement. He then proceeded to state that the increase in the consumption of gas in the town of Nottingham had been 50 per cent. since the year 1842. A temporary depression in the local trade during the last two or three years had, however, temporarily checked the increase, which, but for that circumstance, would have been much larger. The state of manufactures and trade in that district was now improving, and he had no doubt that, in a short time, the increased consumption would be greater than what he had just stated. The witness was here questioned as to the relative price of gas in Nottingham and other towns in the neighbourhood, and stated that, on the average, the prices he had mentioned were lower by about 5d. or 6d. per 1000 cubic feet than in the majority of the other towns in the midland district. He was then questioned as to the "reserve fund," and it appeared from his answers that, strictly speaking, the letter of the act requiring the formation of a reserve fund had not been followed, but that the spirit of the act had, in the opinion of the company, been followed, inasmuch as the surplus profits had been paid into a bank and drawn therefrom from time to time for the purposes of improving and extending the works of the company, being the purposes for which the reserved fund was ordered to be created. The next point upon which Mr. Hawkesley was examined was as to the meters. He stated that the company supplied to the consumers at a fixed annual rental all the meters used for registering their gas; that consumers were not compelled to purchase such meters, but that in the notices was inserted a paragraph to the effect that consumers had the option of purchasing them if they thought fit. They had not, however, had a single application for the purchase of a meter within the last two or three years. Their meters were not of any peculiar form of construction, but the company took exceeding care to have them of the best make, paying a little more for them on that account. They were made by the Messrs. Crosley, from whom the company received them direct. The rental charged amounted to 12½ per cent. on the prime cost. That seemed at first sight a very large amount, but then it included the charges of preserving in order, wear and tear, painting once every one or two years, and the cost of revision, which was made eight times a year—an unusual circumstance—all of which occupied a large portion of their workmen's time. It was almost impossible that any wrong could accrue to the consumer from a defective meter, unless from some original error in the manufacture, which could be readily detected. Any fault would be far more likely to tend the other way, telling against the company. In a properly-constructed meter no fault could tell against the consumer to a larger extent than 3½ per cent., whilst there were many accidents that would make the meter tell against the company to a much larger extent—as much as 50 per cent. The witness then explained the transactions between the company and the lighting committee, and said that the company were very heavy losers by that contract. The learned counsel then examined Mr. Hawkesley as to the question of a compulsory supply of gas, and, in answer, he stated that by the common law they were already compelled to supply gas to whomever might demand it. Knowing that, they had never refused any one. There might, however, be instances in which it would be inconvenient and unprofitable, as where a person living at a distance from any inhabited place applied for a small quantity, say a single burner. As regarded the question of a maximum price, he thought any such proposition would be most unjust and impolitic. A maximum price might properly be applied to the sale of an article supplied in an unmanufactured state, but it was wrong to apply it to a manufactured article, such as gas, where many circumstances tended to produce great variations in the cost of production. A maximum was perfectly justifiable in the case of tolls on a railway or the charges for water. In the case of a gas company a maximum price was not needed, as it would be to their interest to supply the article at the lowest price permitting of a fair profit, in order that they might prevent competition.

The witness was then cross-examined by Mr. Hill, who asked him whether he recollected a clause in the old act (of 1818) to the effect that the dividends should never exceed 10 per cent., and that, for the purpose of ascertaining the clear profits, an examination of the charges and receipts should be made from time to time, and the surplus above 10 per cent. should be placed in the hands of some person in trust, to be applicable to cover deficits; also that such accounts should be laid before the justices of the peace of the town of Nottingham, and that, if it appeared to them that on an average of three years there was a surplus profit above 10 per cent., they should be empowered to order such surplus to be disposed of for the better lighting of the town, or for such other public purpose as they may think fit; the penalty for not laying such accounts periodically before the justices of the peace being £20. Mr. Hawkesley admitted that he was aware of such a clause of the act, and that it had never been fulfilled. The penalty had never been applied for. He did not know whether any applications to the commissioners for letting the common or lammas land had been refused, nor whether the commissioners were eager to get it off their hands. He did not know whether there were many applications for the land, and he could not say whether they were likely to increase much. The gas company paid 8s. 6d. per ton for their coal, on an average; it was supplied by contract, and the price varied occasionally. The price of coal did not govern the cost of manufacturing gas, for when the price of coal was high the company were able to sell their coke at a better price too. For that reason the price of gas was quite as high in places where coal was to be had for nothing as it was elsewhere. They sold their coke at various prices, the maximum being 14s. per ton, and the mimmum 10s. per ton, although in point of fact they were selling their coke at present in Nottingham for 9s., the manufactures of that town not being of a nature to cause so great a demand for coke as those of Manchester, Birmingham, and other similar places. Mr. Hawkesley then entered into details to show the quantity of gas manufactured by them, the average quantity being 200,000 cubic feet per day, being less than a midwinter-day's consumption, but more than a midsummer-day's consumption, which was only about 80,000 cubic feet per day. Their prices were graduated to meet all probable amounts of consumption; but he admitted that during the last quarter they had not supplied any gas at the lowest rate of 4s. 2d. per 1000 cubic feet, and that they had had only one customer at 4s. 4½d.; that was the railway company, to whom they supplied 492,000 cubic feet in the quarter. There was only one method by which a meter could be made to tell against the consumer, namely, if too much water were poured into it. That, however, could not tell against the consumer at the rate of more than 3½ per cent., and would be easily detected and remedied. With regard to the supply of gas to the poor, he considered that the poor might easily be enabled to burn gas, and that the cost of lighting with gas would not be more expensive than the mode they at present employed. The chief obstacle to the general use of gas by the poor had hitherto been the cost of fittings. The Nottingham Gas Company, however, proposed to put up fittings at their own charge, only imposing a small annual rental for their use. For that object there was a clause in the bill before the committee exempting the fittings of the company from liability to be seized for rent, &c. Gas, he thought, might be made available by the poor for cooking purposes, if supplied at a small cost. He was not aware whether they did so in Liverpool, where many poor persons used gas, but he knew that gas was so used in Glasgow and Dundee.

MARCH 14.—SECOND DAY.

Edwin Patchitt examined.—Was clerk to the Nottingham enclosure commissioners. The commissioners had been engaged since 1845, the date of the passing of the Enclosure Act, in carrying out the provisions of the act. A great deal of preliminary matter required to be settled before allotments could be made, and among others there were several hundred claims for compensation to be disposed of. Sales of land had been going on since August last, and the quantity sold now amounted to between 50 and 60 acres. The whole amount of waste land was 1000 acres. Owing to the want of roads there had not yet been many offers of purchase; but the commissioners were now actually contracting for the formation of roads which would be paid for from the purchase money of the land, and seven or eight roads had been set out. The commissioners were not bound to make streets which were left to the discretion of the private purchaser, and were considered as private roads until completed. The sales already made were in all parts of the land; and, on the completion of the public road, he had no doubt sales would increase, and that, in the course of time, numerous villa residences and manufactories would be erected on the land, although from its extent it was not probable that it would ever be covered with buildings. He did not know the acreage of the town of Nottingham, but it was considerably less than 1000 acres. The commissioners were entitled to sell land to defray the expenses of working the act, and when those purposes were carried out the land will be divided among those persons claiming to have a right to it. Of the 60 acres sold already, nearly one-half had been purchased for building on, the remainder having been bought by the railway company and the waterworks company.

This closed the case for the proof of the preamble.

Mr. Hill, Q.C., then proceeded to address the committee on behalf of the petitioners against the bill, and, after recapitulating briefly the history of the company, was about to comment on the conduct of the company with regard to the reserved fund, when he was interrupted by

Mr. Sergeant Wrangham, who contended that his learned friend could not enter on anything that took place anterior to 1842, the date of the act under which the company was now carried on, the company being, in point of fact, constituted afresh by that act, and made a new company.

A long discussion took place on the point of order, and ultimately the committee resolved that Mr. Hill should confine himself to matters subsequent to 1842.

Mr. Hill then continued, and argued that where a company was limited to a certain amount of profit there was always a temptation to bring in new capital; for if a company was making 15 per cent., but were only allowed to make a dividend of 10 per cent., the extra 5 per cent. was by law not their own; they could not put it into their pockets, but were compelled to give it to the public by a reduction of

prices. But, if by creating fresh capital they could lower the profits to 10 per cent., the shareholders would be enabled to receive 10 per cent. for capital which they would otherwise be obliged to invest elsewhere, at probably a much smaller rate.

The CHAIRMAN: That would not be the case if the shares were sold by auction, as they would then have to pay a proportionate price.

MR. HILL: Exactly so; but still the public, who were interested in the surplus, would be no gainers; and one way of increasing the surplus was by limiting the capital to the lowest amount that would work the operations of the company. Suppose a concern could be worked for £50,000, but that a capital of £75,000 was put in, then the gas-consuming public would clearly be injured; because, instead of there being £5000 to come out of the receipts of the concern as profit, there would be £7,500, and the difference would necessarily come out of the pockets of the public. It was thought a matter of importance by Parliament to prevent railway companies from borrowing too much, because it prevented the raising of capital on their own shares, and encouraged undue speculation; but that cause did not operate in the case of a gas company. In such an undertaking the public were benefited by its being extended by loans instead of by increasing its capital by creating new shares. If the sum required were raised by a loan at 4 or 5 per cent. interest, that was all the consumers would have to pay; while, if raised as new capital, they would have to pay 10 per cent. on it in the shape of increased prices, to make up that much profit, or the maintenance, instead of the lowering, of the existing prices. Much stress had been laid upon the results anticipated from the enclosure of the common land; but there had been time enough to ascertain the real demand for land there, and he did not think that there was ground for such anticipations. True, it was said the small demand was owing to the want of roads; people would not buy land until roads were made; but the commissioners could not make roads until they obtained funds by the sale of land, so that, after all, they were travelling in a circle out of which neither purchasers nor commissioners could get. The learned counsel then proceeded to argue that there was no pressing necessity for adding to the capital of the company, as all that was required to be done could be as easily effected by raising money by way of loan. Another point, which he considered of far more importance, was that of a maximum. That question was more important than even that of a limitation to 10 per cent.; for if the maximum price were fixed at 4s. 6d. there would be something distinct, about which there could be no dispute. The company, it was evident, did not like a maximum clause, and his learned friend had termed such a proposition ridiculous and absurd, although he himself had proposed that "ridiculous" maximum clause in the Liverpool Gas Bill, and had persuaded a committee of that House to consent to it. What, however, was the real state of the case? There was a maximum clause in every similar act of Parliament (with but few exceptions), fixed by contracts made with the parties opposing, not for their own benefit, but for that of their fellow-townsmen generally. Mr. Hawkesley said there was no objection to a maximum for water and railway tolls, and had endeavoured to draw a distinction between those articles and gas, as being a manufactured article. But was water brought from a distance and filtered so as to be made fit for public use not as much a manufactured article as gas, although, perhaps, undergoing fewer processes? And as for railway conveyance, although they could not take it into their hands or see or smell it, was it not ten times more a manufactured article than gas? The petitioners proposed that the maximum price should be fixed at 4s. 6d. per 1000 cubic feet, being the maximum fixed in Liverpool. What was the state of Liverpool as regarded the manufacture of gas? By returns he held in his hand, the price of coals there was 14s. per ton, but the price of coke was only 8s. 6d. per ton, so that the price of the raw material was as 14s. to 7s. 9d. between Liverpool and Nottingham, while one of the products was less valuable in the proportion of 8s. 6d. to 11s. It was said that Liverpool coal produced more gas, ton for ton, than the coal used at Nottingham; but the proportion being 8000 cubic feet at Nottingham and 9000 and some odd hundreds at Liverpool, so that that difference did not equalize the prices of coal. It was evident, then, that it was cheaper to make gas at Nottingham than it was at Liverpool, and it was, therefore, only fair that the poor consumer at Nottingham should not be liable to be called on to pay more for his gas than the poor consumer of Liverpool. It might be said, however, that Liverpool was a large place, and the largeness of consumption compensated for the smallness of price. Let them try Worcester: that city was a much smaller place than Nottingham, not one-half, he doubted whether it was one-third, of the size. In an act of Parliament passed last session there was a clause to the effect that, considering the larger the quantity manufactured the lower should be the price, it was enacted that when one quantity was manufactured there should be one maximum, and that when a larger quantity was produced there should be a lower maximum. So that when forty-two million cubic feet were produced the maximum was 4s. 6d., and when it appeared from the accounts that forty-eight million cubic feet were produced the maximum did not exceed 4s. Now, Mr. Hawkesley had stated that the make of gas by the Nottingham Gas Company last year was fifty-eight million cubic feet. Again, the price of coal at Worcester he found was 15s. 6d. per ton; the price in Nottingham they already knew. Surely, then, it could not be contended that gas could be made cheaper at Worcester than at Nottingham! Were the inhabitants of Worcester to be favoured, and the inhabitants of Nottingham to be treated differently? The Nottingham Gas Company had an annual make of fifty-eight million cubic feet, and, if they credited the statement of the other side, a constant and steady increase, and, therefore, even taking the principle applied to Worcester as a basis, they were justified in asking a maximum of 4s. 6d. But it was said a distinction was made between the price of gas supplied for the public purposes and that supplied for private consumption, which gave Nottingham an advantage which Liverpool did not enjoy. What, however, were the real facts of the case? Why, that that contract formed part of an arrangement by which the company cancelled a debt, giving up £1400 in money, and discharging a further sum by agreeing to supply gas for the town lamps at a low rate. That contract, however, would expire in three years, and then the company would be at liberty to make what terms they could. Mr. Hawkesley said that in Liverpool the public lamps were nearly the same as private lights, the one being 4s. 6d. and the other 4s. 2d. per 1000 cubic feet; but then that sum for the public lights also included the expense of lighting. Besides, in Nottingham, in the Flood-road and the Bansfield-road, not only did the public pay the expense of lighting, but also the lamps, lamp-posts, and even the mains were public property. The proposed maximum, as he had said, was 4s. 6d., and at the end of the present contract the lighting committee agreed to be put on the same footing as to terms for the public lamps as in Liverpool. The next point was as regarded difference of consumption, and on that point they ought chiefly to look to the interests of the poor consumer, as the rich man could take care of himself, for when he thought the company's charges excessive he could manufacture for himself if he chose, which the poor man could not do. He was glad to see the use of gas becoming general among persons who, formerly, owing to their station, were not in the habit of using it, especially operatives working at their own home, of whom, in Nottingham particularly, there were many. For that reason he was glad to find that a clause was introduced into the bill which would facilitate the employment of gas by operatives in their houses and workshops, by enabling the company, with safety to themselves, to put up the internal fittings in such houses. The number of customers would doubtless very largely increase, and the total quantity consumed would make up by its largeness the individual smallness. If they sold at a high price, however, although the profit on each cubic foot would be greater, yet they would find the total would be less. A curious instance of that had occurred in Birmingham, where the profits had risen more, and there had been a greater dividend, when prices were low and coals were dear than when coals were cheap and prices high. The Birmingham and Staffordshire Gas Company in 1826 were charging 12s. per 1000 cubic feet for their gas, coal being at the time 4s. per ton; in 1846 coal was 12s. 3d. per ton, and the company were then charging 6s. 8d., 6s., 5s., and 4s. 9d. per 1000 quarterly, and 1s. less and 10 per cent. off if taken annually. In the former year the dividend was £2. 1s. 4d. per cent., and in the latter year of low prices and dear coal the dividend was 10 per cent. How that was to be accounted for, except by the increased consumption, he did not know. The learned counsel here mentioned incidentally that the price of coal fluctuated considerably at Birmingham, according to the demand for the smelting and manufacture of iron. He then proceeded to speak of the question of quality, and urged that a quality clause should be introduced into the bill, as was the case in the Liverpool act. By clause 42 of that act it was provided that all gas supplied to the public lamps should be of the best and purest quality, and produce a light from each burner equal to the light of 18 wax candles of 6 to the pound, each not less than 13-16ths of an inch in diameter, 9 inches and ½ in length, and 1170 grains in weight, the wicks being properly snuffed. It was very important that the gas used in Nottingham should be pure, as the workmen at the lace and stocking looms were obliged to hang the light close over their work, and if the gas were of a noxious quality it would be most pernicious to their health. He next adverted to the question of a compulsory supply. Mr. Hawkesley, who was a better engineer than he was a lawyer, stated that the common law already rendered it compulsory on gas companies to supply gas on demand. That, however, was not coincided in by his learned friend, whose opinion on common law he would prefer even before Mr. Hawkesley's. According to analogy, however, the principle was not repugnant to the common law of the land, as it had always been held that a publican or other person professing to serve the public could not capriciously refuse to serve any one wanting to deal with him. Mr. Hawkesley had stated that the company had never refused to supply gas on demand, as they knew that the law compelled them to supply; the company, however, it appeared, did not take their law from their engineer, for they were in the habit of refusing to supply gas in cases where a man had gone away leaving arrears of gas rates until the next tenant had paid up those arrears. That procedure pressed peculiarly hard on publicans, and it was obviously unjust that where the company had a summary mode of procedure against defaulters they should prefer coming on an innocent party. The petitioners, however, did not ask for an unlimited compulsory clause. All they proposed was that a certain limit should be fixed, and that within that limit the company should be compelled to supply gas on demand. With regard to the question of meters, he did not think much difference of opinion would arise between his learned friend and himself, and he would not, therefore, enter on the subject. In conclusion, he hoped the committee would put very strict limits on the capital of the company, and inquire on what ground they opposed a maximum clause. He should put in evidence with regard to the cost of the manufacture of gas, showing that what was asked could be well done and yet leave a handsome profit, and then he should appeal to the example of other towns, and prove—not the propriety of some maximum, for of that he believed there was no doubt—but what that maximum should be.

Some conversation took place respecting the real average price which the Nottingham company received, and ultimately it appeared that, dividing the total sum received by the total quantity sold, the average was 4s. 4d. per 1000. The returns of the company in the last year were £12,540. 16s. 9d.

In answer to questions from MR. W. BROWN, it was stated that no dividend was payable on the premium at which shares were sold by public auction. A £100 share, although selling for £200, would only receive dividends on £100. The company, it was also stated, would only sell as many shares as would fetch the sum required, so that, if the shares sold at cent. per cent., the £40,000 new capital

proposed to be raised would only add a nominal dividend-paying capital of £20,000 to the old capital.

John Hill, of Steinton, near Nottingham, was then called.—Is a lace-manufacturer. Had erected a gas apparatus, which had been in use five years. The gas was used in his workshops. The average cost of manufacture was 1s. 11¾d. per 1000 cubic feet, including 10 per cent. on the capital laid out in the erection, namely, £250. That per centage amounted to 4d. per 1000 cubic feet. The coke produced was used in heating the retorts. He used Birchwood coal, which, with expense of delivery, cost 10s. a ton. When he erected those works, the Nottingham company had no mains at Steinton; not till two years after. He consumed 1000 cubic feet a day, but he could make 4000 if required. He had no cost of mains, buildings, or collection. The wages paid for manufacturing gas amounted to 2¾d. a day, paid to a man who was employed 1 hour 1-5th a day in managing the apparatus. He is the stoker of the steam-engine used in their business. They had no meter, and only estimated the quantity made by measuring the cubic contents of the gasholder. The 4d. per 1000 cubic feet, mentioned as interest for cost of erection, was only on the calculation that they consumed 4000 cubic feet a day, the quantity they could manufacture if required. On the quantity actually consumed, 1000 cubic feet, 4d. per 1000 only amounted to 6 per cent. In cross-examination he said on his actual consumption the cost of manufacture was 3s. per 1000. His calculations were based on experiments made in one week (last week), for the purposes of this inquiry. He found from those experiments that he made 1006 feet for 1s. 11¾d. He found he could make gas for himself cheaper than it could be supplied to him by the company at the company's prices. The quality was equal to that made at Nottingham.

Mr. Gray, lace-manufacturer at Lenton, near Nottingham.—Found a gas apparatus on his premises when he first took them. The gas he made by it cost him 2s. 1½d. per 1000. He used Birchwood coal, for which he paid 10s., delivered in his own yard. In Nottingham that coal cost 8s. The quality of his gas was satisfactory. At one time he was about to lay down pipes to supply his neighbours, but the gas company sent down workmen, took possession of Lenton, and opened the ground, but left the place unlighted for two years. Mr. Alliot, Mr. Burton, and others of his neighbours, made their own gas. He could not say when any of their gasworks were erected. The company came to Lenton in 1843. Mr. Mills began to make gas at his factory at Lenton as far back as 1828; the others had made gas anterior to the company coming to Lenton, but since then some had ceased to do so. His own annual consumption was 676,000 cubic feet. He did not keep his gas accounts separate from his other accounts. He purchased coal on purpose for making gas; he used 82 tons of coal a year for gas. He estimated the amount he paid for the gasworks at £100. They were not new. He had no meter, but estimated the quantity consumed by placing a pole marked with feet and inches and an index attached in the gasometer. His calculations had been furnished by his engineer, who made the gas. He did not know the size of his gasometer; 1 ton 16 cwt. of coal made 13,000 cubic feet. The coal he generally used cost 5s. 6d. a ton, but he could not say exactly how much of it he consumed in a year for making gas alone. The witness, in the course of a very severe cross-examination, for the purpose of ascertaining the actual expense he was at for manufacturing his gas and the quantity made, repeatedly hesitated and contradicted himself, making statements at variance with those he had before made. He could not state either the total quantity of coal he used for making gas, the total cost of manufacture, nor the mode he employed for estimating the quantity made. The written calculations to which he had before referred were, he said, made by his engineer, and were based on experiments made at the direction of Mr. Moses Wood, for the purposes of the inquiry. In that experiment he admitted that Birchwood coal, which was of a quality superior to that he generally used, had been employed: 36 cwt. of that coal produced more gas than the coal he usually made his gas from, but he said the difference in the product was compensated by the lower cost.

MARCH 15.—THIRD DAY.

Mr. Gray examined.—He supplied gas to persons having standings or lace-looms at 1s. 6d. a week, for which they were entitled to burn 24 hours a day; that was the regular price, the same as charged by the company in Nottingham. He could not say how many standings, as the quantity varied very considerably. The rent for gas was always charged separate from the rent paid for the standings, and was the same summer or winter. With reference to the company having turned him out of Lenton when he proposed to lay down pipes to supply his neighbours, the reason why he did not go on was that he did not wish to contend with a corporate body. He could, however, still supply his neighbours at a cheaper rate; he would be glad to supply gas at 3s. 6d. He sold his pipes to the company. The company had no works at Radford at that time. Mr. Mantore, who lived near the company's works, had erected works for himself since 1842.

Mr. John Hill, father of the witness of that name examined yesterday, was then called, but nothing was elicited beyond what his son had stated.

Mr. Samuel Clegg called.—Had been acquainted with the manufacture of gas for 47 years. Had reported in the case of the Liverpool bill. He recommended the quality clause in that bill. He thought such a clause a very proper and necessary one to be inserted in such bills. It was important to fix the quality to be supplied, as very different qualities of gas could be extracted from different sorts of coal. He had also reported in favour of a maximum price being fixed in that bill. He strongly recommended the insertion of such a clause in all the bills with which he had been concerned. The prices of coal and coke were the chief elements in estimating the prices of gas, but there were others which also required to be taken into consideration. A difference of 1s. a ton in the price of coal causes a difference of 1d. per thousand in the price of gas. The variance of the price of other ingredients would not cause a difference of more than a halfpenny. The price of gas depended on the quality as well as the price of coal. The quantity consumed also made a difference. He considered the Liverpool coal the best in England for making gas. It was cannel coal. It was, perhaps, not so good as Scotch parrot coal. He could not say whether it was better than the Lesmahago coal, which was generally used in Scotland for making gas. He thought it quite fair that the large consumer—say of two million feet—should pay as much as a person burning a single light. It was on that opinion he decided in favour of a maximum. He also thought the town lamps should not be charged less than private lights, for the difference would after all only come out of the pockets of the private consumer. He invented the meter manufactured by the Messrs. Crosley. It was as good as any. All were subject to variations of registration up to 7 per cent., but the average was 3½ per cent. He did not think there was any difference between a large consumer of gas and a small one, except that there was a less expense of collection and a smaller risk of bad debts. A large consumer could protect himself against an excessive charge by manufacturing for himself, and that was frequently done; but the small consumer had no such protection, and therefore he thought there ought to be a maximum fixed. 4s. 6d. was a fair maximum for a make of fifty-eight million feet. He was aware of the difference of price of coal and coke at Liverpool. The consumption at Liverpool was two hundred millions, but he could not say whether that higher consumption counterbalanced the difference of price of material. Up to a certain point an increased consumption was followed by an increasing ratio of profits, but above that point there would be no corresponding increase of the ratio of profit. That point might be placed at two hundred or two hundred and fifty millions. Above that amount duplicate works would be required. One work would not be able to supply a larger quantity, as the cost of mains would then become heavier than if two works were used, and the size to which the mains would have to be increased, to an impracticable size. If all London were supplied from one gasworks the mains would have to be five feet in diameter. He did not know what were the average residual products of a ton of coals in coke, tar, and ammoniacal liquor. Cannel coal yielded very inferior coke, which was not marketable in London; he knew that, having tried cannel coal in London, and could not dispose of the coke. He persevered in his opinion that 4s. 6d. was a fair maximum for a consumption. He admitted, however, that local circumstances would make a difference, a scattered town causing more expenses than a compact town. Extent of area, amount of population, and number of manufactories and private houses were all elements to be considered in estimating the price. There was but little difficulty in forcing gas down to places lower than the works, and that would not tend to enhance the price. Seven-inch pipe would cost £1000 a mile for laying down all complete. The interest of the whole of the capital of a company ought to be taken into account in fixing a maximum, provided that capital had been judiciously laid out. In most country towns, however, two capitals had been expended, owing to the improvements in the manufacture necessitating considerable alterations. He could not say whether, if the price at Nottingham were fixed at 4s. 6d., that would cause a loss to the company by some or all of those who had been paying the lower price preferring to manufacture for themselves, or whether there would be a gain by the increased consumption by the poorer consumers compensating for the loss from the former case. That was a subject requiring calculation.

Mr. Croll was then called by Mr. Hill, and, in answer to questions, stated that he was a gas engineer, and had been connected with gasworks for nearly ten years. He had been employed at the Chartered Gas Company's works in Brick-lane for six years. The consumption there was very great; in the depth of winter, on the shortest day, the consumption reached 800,000 cubic feet. That was four years ago. He was then the superintendent of those works, and directed the manufacture of the gas. He had the responsibility of the quantity and quality. He had since leased the Coventry Gasworks, and had erected the Tottenham and Edmonton Gasworks, and was still connected with the latter as one of the directors. He could not state what was a fair maximum price, unless intimately acquainted with the district, and the quantity to be supplied. The price of coal, the yield, the value of the residual products, the quantity made, and the extent of mains, were the essentials for forming an estimate. He was then asked to make an estimate on the following data:—Price of coal, 7s. 9d. per ton; value of coke, 9s. 6d. to 10s. per ton; yield from one ton of coal, 8,000 cubic feet; quantity made, fifty-eight million cubic feet. He was also requested to look at a map of Nottingham, to guide him as to the extent of mains; but this he stated he could not do, as he should require to know the exact length of mains.

Mr. Hill proposed to examine Mr. Hawkesley on this point, but Mr. Hope (for the promotors) objected. The room was cleared, and, after deliberation, the counsel decided not to recal Mr. Hawkesley at this stage.

The examination of *Mr. Croll* then proceeded. He could give no opinion as to what should be a fair maximum until certain of the length of mains. He was then questioned on the subject of meters. Both wet and dry meters are now used in London. Until a few years ago wet meters only were used, but now dry meters are getting more into use. The successful dry meters were a much later invention than wet meters; for, although a dry meter was invented on the first introduction of gas, it had been found a failure. The dry meter now in use was generally preferred by the public, and, in several instances, gas companies had been compelled by their customers to substitute it for the wet meter. The register of the wet meter depended on the height of water in it; and, as that was constantly varying, owing to evaporation and other causes, the registering capacity of the chamber varied also. It was like having a bushel measure with a moveable bottom. The only successful dry meters hitherto invented were those

invented by Mr. Defries and by himself. The extent of variation in wet meters depended on the size of the meter. In small meters it was very great. He had tested a three-light wet meter supplied by a most respectable manufacturer, and had found the variation to be 32 per cent. A three-light meter was enough for three or four lights. The houses in London were generally very large, and usually had ten-light meters. Private residences would use three-light meters, or even smaller ones; but at present that description of houses was not lighted by gas in London. Retail shops in London averaged about five lights. A small meter is, comparatively speaking, subject to great irregularities. The directors of all the gas companies in London were, he knew, anxious rather to have meters registering against themselves than against the consumer. He thought a little superintendence would not be unadvisable to satisfy the consumer, but the meters would have to be visited very often. It was of great importance to the consumer that the meters should be inspected frequently, because the wet meter was so arranged that, if the water fell below a certain level, the gas was at once shut off and he would be deprived of light. That was effected by means of a float in connection with the valve of the meter. That was invented by Mr. Clegg, and was applied in Messrs. Crosley's meters. The witness then explained why the Imperial Gas Company had first prohibited and afterwards consented to use the dry meters invented by him (Mr. Croll); the reason being that the company had at first been dissatisfied with the results of certain experiments made by him for the purpose of testing the comparative merits of the wet and dry meters, but were afterwards induced to consent to their use by the result of subsequent experiments. From those experiments it appeared that the average extreme variation was 1⅝ per cent. against the consumer, but that was the result of extraordinary tests. The Messrs. Crosley's meters varied both for and against the consumer. By filling one of their three-light meters with water as full as possible *above* the true water line, and reducing the quantity as much as possible *below* the water line, so as not to affect the light, however, the result was a variation of 32 per cent. between the highest and lowest water line, at which the burner gave a steady light. The supply of gas was in all cases the same; but the quantity registered varied, as he had stated, 32 per cent. If there were some person to attend to the wet meter every 24 hours, in that case they might get a correct result, but with a longer interval they would not reckon on a regular register. He could not say in what time the evaporation would be large enough to falsify the register, as that depended on circumstances. For instance, if the water were filled in to the highest level, and the meter were placed in a warm room, there would be evaporation enough in one week perhaps to produce a difference of 10 per cent., while in a cold place it would be much longer before such an effect would result. He did not know the average evaporation. When he was at the Chartered Gas Company's works the inspectors went round once a quarter and filled in the water. He did not have more than the average number of complaints while there. There was a strong inducement to the inspectors to place the water above the water line, because if there were too little water in the meter the consumer was exposed to have his gas suddenly cut off, and thus be deprived of light; and the inspectors placed the water as high as possible to prevent the chance of complaint. That was contrary to the wishes of the directors. He would not state at what point the inspectors usually found the water on their quarterly visits. The consumer, however, by taking out a plug could let off the surplus water, and by tilting over the meter 10 degrees could let all the water out, and get his gas for nothing. Very few consumers, however, were acquainted with the construction of meters, and they are told when they have not enough gas to pour in water till they have.

Cross-examined.—He was the promoter of a bill which would come before the consideration of the committee—the Central Consumers' Gas Bill—in which a supply of cheap gas was the main element. The parties concerned in the present bill (the Nottingham bill) had come to him for his evidence unsought. He did not think 10 per cent. was an extravagant allowance of profit to a gas company. He proposed in his bill to limit the price to 4s. per 1000, and was sanguine of a 10 per cent. dividend. Those were the cardinal points held out to the shareholders and consumers. He had been a lessee of the Coventry Gasworks, and was still a director of the Tottenham works. The price in the latter was 7s., and the cost of manufacture was scarcely 2s. per 1000. The dividend in the Tottenham concern was 6 per cent. the first year, which ended in September last. A second dividend had not yet been declared. The price of coke there was only 12s. per chaldron, not more. That was about the general average price in London. He did not remember the amount of consumption at Tottenham, but the rental was £1710. They made the same charge to all consumers. There was no difference in the charge for the public lamps. They had one large consumer who, in the last winter quarter, took 120,000 feet; he was charged 7s. The present charge at Coventry was from 6s. 6d. to 4s. 6d. When he had the works the charge ranged from 9s. to 6s. 6d. The consumption when he left was twenty millions a year. Coventry was a compact town in the centre. There were several outlying places, the farthest being two miles off. He did not know the exact number of miles of main; but before he took the works he went down and viewed the place, and so formed an idea of the extent. At the time he took the works the gas company, who were working it themselves, charged 10s. per 1000, but they had paid no dividend for four years before. He agreed to pay a rental of £1500 a year, and 45 per cent. additional if the rental paid for gas rose above £3000. After he took the works he lowered the rental about 33 per cent. below the 10s. previously charged, his average charge being about 7s. The gas rental increased pretty speedily on that reduction, and the fourth year after he engaged to reduce the rates to 6s. 6d. and 4s. 6d.; but previous to the period for making such reduction he disposed of the lease. He received a bonus on disposing of his lease. The average price of coal at Coventry was 16s. per ton. The coal produced in the immediate neighbourhood was useless for gas purposes; it was, however, very cheap, and was largely used for household purposes. In consequence he sold very little coke, and, indeed, had no market for it. The only outlet he had was to maltsters, for malting purposes, who paid 9s. or 10s. a ton. They took very little, however, and he had actually given away 800 quarters because he could not sell it. There were lammas lands at Coventry lying between the town and the outlying villages. He had not thought it worth his while to extend his works to those outlying places, but Mr. Robinson, who took the lease of him, had done so, and had found it profitable, although charging less than he (Mr. Croll) had done. Mr. Croll was then examined as to the cost of manufacturing 1000 cubic feet of gas at Nottingham, and estimated it at about 1s. 6d., the data being the same previously mentioned. On being asked to particularize the items of the cost price, he stated them as follows:—Coal (at 8s. per ton, producing 8000 cubic feet), 1s.; labour, 3d.; wear and tear of retorts, 2d.; general wear and tear, 1½d.; lime for purification, 1d.; interest on cost of plant (which for making fifty-eight millions would be about £8000, but say £10,000, and reckoning the interest at 10 per cent.), 4d.; floating capital required for maintaining a supply of coal, reckoned at £2500, interest at 10 per cent., 1d.: total, 2s. 0½d. Deduct sale of coke equal to 6d.; net cost, 1s. 6½d. He took the quantity of coal for sale at 8 cwt., after heating the retorts. The coke produced from a ton of coal was more than was required to convert the same quantity of coal into gas. He had supposed a ton of coal to produce 12 to 13 cwt.; but he only took the quantity available for sale at 8 cwt. He put down nothing for tar, allowing that to be used for fuel. He allowed 4s. for the 8 cwt. of coke, or 10s. a ton.

Cost of Manufacturing 1000 *Cubic Feet of Gas.*

Coal	12d.
Labour	3
Wear and tear of retorts	2
General wear and tear of works	1½
Lime	1
Interest on cost of plant	4
Interest on floating capital for stock of coal	1
	2s. 0½d.
Deduct for sale of coke	6
	1s. 6½d.

That did not include the cost of keeping the gasholders in repair, and the cost of mains. The total cost of distribution and of profit, at 10 per cent. on distribution, he estimated at 3s. That included mains, officers, servants, and everything. There ought to be frequent inspection, to ascertain if the meter registered correctly—at least once a fortnight if wet meters were used. If dry meters were used any defect would at once show itself, and the company would ascertain whether they had been tampered with. Continuous inspection of dry meters was not necessary, as periodical inspection would suffice. The public, he thought, would be better satisfied if the inspection were made by indifferent parties.

The witness was cross-examined by Sergeant Wrangham as to the cost of manufacture, and repeated that, taking the data before given, the cost of manufacture would be 1s. 6d., and of distribution, with the profit thereon, 3s. He could not state exactly the cost of 40 miles of main unless he knew the average size, but he had estimated it at £48,000. He took the annual deterioration of main and service pipes at 1 per cent., or, on fifty-eight millions, equal to 2d. per 1000. Cast-iron main-pipes he considered, from his experience, almost everlasting. They were not subject to corrosion or oxidization, and needed no repair. He had taken up pipes which had lain in the ground 24 years, and found them none the worse.

An argument then took place as to whether the leakage, estimated at 11 per cent., should be calculated on the cost of consumption only, or on the whole cost. Neither party could agree, and ultimately they were interrupted by the announcement that the Speaker was at prayers.

MARCH 16.—FOURTH DAY.

Mr. Croll was again under examination.

Mr. Sergeant Wrangham begged to recal the attention of the committee to the figures stated yesterday. They had made the cost of the production of gas into the gasholder (allowing 10 per cent. as interest on a capital of £10,000., and 10 per cent. on a floating capital of £2500) to amount to 1s. 7½d. per 1000 feet. They would next consider the other expenses. If a maximum of 4s. 6d. were calculated on a make of fifty-eight millions, and the company received a payment on one-ninth less, they would, in fact, only pocket 4s. We have proceeded in estimating the cost of distribution as far as 1s. 7d. for interest of capital in mains, and 2d. for permanent deterioration, and other charges of distribution 1s. 7d. Is that correct?

Mr. Croll: Yes. I make the total cost for distribution 3s. 4d. To that is to be added 4d. for interest of capital invested in the plant, and 1d. for interest on floating capital. That must be added to the estimate of 1s. 7d. for distribution and 1s. 9d. for mains. He could not say what allowance should be made for meters, superintendence, wear and tear, unless he knew the number of meters and the rent charged by the company. Next with regard to staff. The expense of the staff necessary for the distribution, such as clerks, inspectors, engineers, &c., would be about £1000 a year, or about 4d. per 1000 feet on fifty-eight millions. He would not say what ought to be put for rates and taxes, as he did not know what they were. He made no allowance for legal and parliamentary expenses. He made no allowance for bad debts. He had very few bad debts at Coventry. There was £360 still uncollected, but he expected to receive a large portion of it. He did not see why there should be more bad debts at Nottingham than at Coventry. He made twenty million feet at Coventry per

year, and, as the £360 was spread over four years, that would give a 1d. and 1-6th per 1000. He was then examined as to the allowances to be made for improvements. Discoveries and improvements tending to perfecting the mode of working were always being made, and a company had to lay out a good deal in bringing itself up abreast of the times; but he was not aware that it was usual to lay aside a rest or reserve fund to meet such contingencies. Any improvements or experiments to be made at Coventry he took out of his profits. He thought the difference between 10 per cent. and 5 per cent., the ordinary interest for money, gave a sufficient margin to allow of the cost of experiments and improvements being paid out of the profits. He would admit that in cases where the profits were limited to 10 per cent. there would be no inducement to make those outlays unless there was a reserved fund for such purposes. He thought the 1 per cent. he had put down for permanent deterioration, or 2d. per 1000, would cover those charges also. That per centage would not all be expended for repairs, and the residue would accumulate. He made no allowance for accidents and contingencies, as they never occurred to any great extent, and when they did the company ought to suffer in their dividends, as they could only arise from carelessness. Neither did he make any allowance for compensation for accidents caused by breaking up the roads, &c. He had given them all the items he had taken into his calculation. He had given the turn of the scale to the company in every process most amply.

Some discussion then took place between the witness and the learned counsel on each side as to whether leakage should be considered as an item in the cost of manufacture, or as an item in the cost of distribution; Mr. Croll and the counsel for the opponents of the bill advocating the former proposition; and Mr. Sergeant Wrangham, for the company, contending for the latter.

Mr. Croll said the leakage took place for the most part in the mains, cast iron being to some extent permeable, while the joints were always leaky. The leakage at Nottingham, he had heard from Mr. Hawkesley, was 11 per cent. Leakage rendered mains of larger capacity necessary than if there were no leakage. A leakage of 11 per cent. on a make of fifty-eight millions would cause a difference of six millions and a half between the amount manufactured and the quantity delivered and paid for to the company. Of course he should make allowance for the difference in the capacity of the mains for delivering fifty-one millions and a half and those for delivering fifty-eight millions; but, as the mains were larger in the vicinity of the works, there was a larger surface for leakage, and thus the greater part of the loss took place in the first half of the mains. Leakage, of course, increased the cost of mains, but, from the cause he had mentioned, not to so great an extent as would at first appear. The difference of 11 per cent. between the make and the delivery would make a difference of 11 per cent. in the cost and capacity of the mains. He thought the leakage ought to be taken off the cost at which the gas was really produced at the station; because having allowed a sufficient sum for the expense of the mains, and there being no other expense with regard to leakage than the cost of making a sufficient quantity to allow for leakage, it ought to be charged in proportion to the cost of production at the works. It could not be reckoned at the gross expense, as no charges of distribution, meterage, collection, &c., were incurred upon it. It ought to be reckoned at 11 per cent. on the cost of production, which would raise that cost from 1s. 7d. to 1s. 9d. He thought 2d. per 1000 feet was quite enough to allow for leakage. He was aware that the Nottingham Company were bound by act of Parliament to have a reserved fund to meet the cost of alterations and improvements. Improvements were always made with a view to lowering the cost of production, and thus left a new profit. He thought the only improvements now likely to be introduced would be something in the carbonization of the coal and the formation of the retorts. In the latter case, however, new retorts would not be taken until the old ones were worn out, so that that would not cause any additional expense. The great mass of the fixed capital of a gas company was in the mains. He put down £10,000 for the amount of capital required for the production of the gas, and £48,000 as the capital required for laying down 48 miles of main, or nearly as five to one compared with the cost of manufacture. Improvements he thought would only affect the cost of production. When he said that he thought 10 per cent. was a fair profit he was of opinion that that per centage ought to cover any loss caused by the carelessness of the company. That was the only check the public had over the company. Mr. Croll was then examined as to the question of bad debts, but no additional point was elicited from him. There was a distress clause in the Coventry Gasworks Act, but as he only held a lease of the works it was questioned whether the company could delegate their summary power to him, and therefore he had never acted on it. Perhaps if he had he should not have had so large an amount of debt still due to him. He had heard the rent charged by the Nottingham company for meters, and thought it a very profitable one, as they would get back the cost price in six years and a half. He had no doubt private tradesmen would gladly supply meters on the same terms. He had estimated the cost of staff at 4d. per 1,000, but he could not enumerate the items. That sum did include engineer and secretary. £1200 a mile for mains was a very high estimate on 40 miles of main. 18 or 20 miles of main was greatly beyond the quantity at Coventry. He made twenty million feet a year there.

Mr. W. Brown here requested that the witness would prepare the items of the cost of production, distribution, &c., in a tabular form, by Monday.

The Chairman hoped they would be engaged in a case of a different description then.

Mr. Hill: I fear we cannot close this case to-day, as we have another witness to examine. It was then agreed that Mr. Croll should prepare the table as requested.

Mr. Croll here begged to explain that, in giving his evidence with respect to the reduction of prices at Coventry, it had been understood that he had alone, and without Mr. Robinson's concurrence, lowered the prices of gas. What he meant to have conveyed was, that that reduction did not take place until after he had sold the lease to Mr. Robinson, although it was promised before; and that Mr. Robinson had gone along with him in that measure, and was most anxious it should be carried out. He used two sorts of coal when he was at Coventry, one at upwards of 16s. a ton, and another at a lower price, produced in the neighbourhood. He generally used equal portions of each.

Mr. Samuel Moore, clerk of the peace of the town of Nottingham, was then called, and examined by Mr. Merewether.—Had been clerk of the peace for the last three or four years. He was aware that the Nottingham Gas Company was bound to hand in its accounts periodically to the justices of the peace of Nottingham in quarter sessions assembled. No such accounts had, however, been delivered to his knowledge until February 7 (this year). Mr. Moore then produced copies of the accounts so delivered, and handed them in to the committee. He proved that they were copies of the accounts delivered by the company. Some discussion took place between counsel as to whether he should read the items for purposes of evidence. Ultimately it was decided that Mr. Merewether should ask him to state the returns opposite to each year given as for receipts and expenses. They were as follows in round numbers :—

	Receipts.		*Expenses.*
1843	£14,000	1843	£11,000
1844	13,600	1844	10,700
1845	20,000	1845	17,000
1846	20,000	1846	11,500
1847	15,000	1847	15,400
1848	15,000	1848	9,200

Mr. Hope: There are other public bodies, as, for instance, the lighting committee, who were similarly bound. They had delivered in their accounts as required for the last three or four years. He had never asked the gas company to deliver their accounts.

Mr. Merewether said that closed their case as far as regarded the preamble, and it would have been his duty to sum up, but that the efforts of his leader (Mr. Hill, Q.C.) had rendered such a course unnecessary.

Some conversation took place on the subject of adjournment, Mr. Sergeant Wrangham saying they could not meet a case until they knew what it was, and they could not go on until the production of the accounts to be furnished by Mr. Croll. As there seemed to be really no opposition to the preamble, which merely declared the purpose of the bill to enable the company to raise money, to let that be declared proven, and discuss the various questions of detail as they arose on the clauses, and divide each separately,

The committee then declared the preamble to be proven.

The Chairman then said that Mr. Bernal had sent to state that an addition was required to be inserted in the preamble, stating the amount of capital raised by the previous act, how expended, and how much, if any, remained.

Mr. Sergeant Wrangham said care should be taken to have that addition inserted immediately.

MARCH 19.—FIFTH DAY.

Clause 1 was agreed to.

On clause 2, fixing the amount of capital to be raised at £42,500, a long and desultory conversation took place between counsel on both both sides as to whether the nominal value of the shares sold by auction should be paid up at once or by instalments. Both parties agreed that, according to the terms of the bill, all amounts of premium at which the shares were sold in the market would be payable at once, and would be applicable to the purposes of the concern in the same way as capital, but would not bear interest, interest being payable only on the nominal value of the shares. No amendment, however, was proposed, and the clause was agreed to.

On clause 3 it was proposed by Mr. Hill, for the opponents of the bill, as an amendment, that the company should have the power of selling new shares to increase their capital only at those times when they could obtain cent. per cent. premium. All amendments were, however, opposed by the promoters of the bill; and ultimately the committee decided that the clause should stand as originally proposed.

Clauses up to clause 16 inclusive were agreed to without discussion.

On clause 17 being read, Mr. Hill objected to the power it gave the company of capitalizing loans, on the ground that it affected the sale-by-auction clause.

After some discussion it was agreed that a proviso should be inserted extending the provisions of the bill with regard to sale of shares by auction, and the disposition of the premiums to all shares created to be sold for the capitalization of loans.

Clauses up to 24 inclusive were agreed to.

The additional clauses were then taken into consideration.

Clause A, referring to sale of shares by auction, was agreed to.

Clause B, referring to letting meters, was agreed to.

Clause C, giving the company the power of entering buildings to ascertain the quantity of gas consumed, was agreed to.

Mr. Merewether, for the petitioners against the bill, then proposed to insert a clause compelling the company, on the application of the owner or occupier of any house within certain limits, to supply them with gas on a penalty of £5 for every day they neglect to supply the gas after 10 days from the application, the company, however, not being compelled to put down mains where none already exist.

Mr. Sergeant Wrangham opposed the clause as novel and unnecessary. Besides, he did not think the clause would be very acceptable to the consumer, for it also enacted that the party so applying should in all cases be required to deposit 6 months' payment in advance, as security for the payment of the gas he might consume. He considered this a most dangerous and odious provision, which would, from its

very nature, be inoperative, as no company would incur the risk of putting it in force. The clause in the Liverpool act, from which this clause had been framed, only enacted that the company might require "a reasonable sum" as a deposit.

Mr. Hawkesley was then called and examined on the point. He said he was not aware of any case in which the Nottingham Gas Company had refused to supply to gas consumers residing within a reasonable distance, except in the cases of publicans, where the outgoing tenant had left arrears of rent for gas, and the incoming tenant refused to pay those arrears. Publicans were in the habit of leaving their houses at very irregular intervals, and on going out their goods were not removed, but valued to the incoming tenant, who charged the arrears for gas rent as a set off against the amount at which the goods, &c., were valued to him. A publican sometimes sold his business in the middle of a quarter, when the company could not claim for the amount already consumed, nor make use of their summary powers, as the gas rent was not due until the end of the quarter. The way in which the transaction was effected was this:—The goods and stock of the outgoing tenant were valued to the incoming tenant by a person called a valuer, who was accustomed to the business. One of the company's men then went down, took the state of the meter, and then stated the amount due by the outgoing tenant, against whom it was charged as a set off by the incoming tenant, so that, in fact, the latter actually received the arrear due to the company, to whom he was in honesty bound to pay it over. It was only in case a publican under these circumstances refused to pay the arrears that the company refused to supply him with gas. The average amount of rent paid for gas in Nottingham by publicans was £7 or £8 for the winter quarter. There were between 200 and 300 publicans in Nottingham—that is, licensed victuallers—besides a great many beershop-keepers. Many of the latter, however, were not very large consumers, so that the whole average would not be so large as he had stated. Their rules were well known, and the company invariably acted upon them. The consequence to other consumers, if their rules in respect to arrears were not acted upon, would be that, if the company sustained a loss of income, it would, in the end, have to be sustained by the town at large, as it would interfere with any subsequent reduction of prices, in the same way as the low sum charged for the public lamps produced a difference of charge to private consumers. The better the rent was collected the better it was for the consumer also. With regard to the question of a deposit, he thought it would place the company in a very odious position, and there would be found many difficulties in carrying it into execution. The amount of gas to be consumed is always uncertain of calculation, and would never be known until the quarter was out. They could only make an uncertain estimate, and the consumer would reckon it too low, as the company would probably estimate it too high, so that there would be endless dispute.

Cross-examined.—You are engineer of the waterworks as well as of the gasworks, and, therefore, have had a double opportunity of forming an accurate opinion. Why do you particularly select publicans as the exception to your rule of not refusing to supply gas when demanded?

Mr. Hawksley said: Publicans were more in the habit of leaving at irregular intervals than other tradesmen, who usually waited till the end of the quarter to quit their houses. The company then had a claim on them, and could enforce the payment of their gas rents. Publicans were an exception as regarded gas and water, and everything else. In other trades there were generally responsible people, but in Nottingham, at least, the publicans were not so. There had not been five midnight flittings in Nottingham of other trades during the last five years, but publicans made seven or eight flittings in the course of a year.

Mr. Merewether having replied, the committee, after a short deliberation, resolved to reject the clause.

Mr. Hill then moved the insertion of a maximum clause fixing the maximum price to be charged by the company at 4s. 6d. per 1000 cubic feet. In support of that clause he proposed to examine Mr. Croll, who had leased the Coventry Gasworks, and was, therefore, in a position to state what—taking the relative circumstances of the two towns into consideration—would be a fair maximum price for the sale of gas at Nottingham. It appeared from Mr. Croll's statement that the cost of production, distribution, staff, &c., amounts to only 3s. 4½d.; therefore, in fixing the maximum at 4s. 6d. they left a margin of 1s. 1½d., which was verge enough for even very considerable errors of calculation. That maximum included the interest on £10,000 for plant, on £40,000 for mains, on borrowed capital, cost of staff, leakage, bad debts, rates and taxes, and, indeed, everything. They would next show the committee how that maximum included their profit of 10 per cent.; and he, therefore, did not think there could fairly be any objection to the clause.

A member of the committee here requested the room to be cleared. On the room being opened, the Chairman stated that the committee had deliberated on the principle of a maximum, and had come to the resolution that, instead of inserting a maximum clause, a clause should be inserted compelling the company to supply the public lamps at a price not less than the cost price, on the expiration of the present contract in 1853.

MARCH 26.—SIXTH DAY.

Mr. Sergeant Wrangham said they had prepared a clause embodying the resolution of the committee that, instead of a maximum clause, a clause be inserted compelling the company to supply the public lamps at a price not less than the cost price, and he would submit it to the committee.

Mr. Hill said that resolution had rendered it necessary that the only guarantee left them should be sufficient. He urged that some means should be provided to afford the public an opportunity of verifying the accounts of the company and ascertaining the cost price of gas, that the people of Nottingham might know what they were doing. He, therefore, proposed three clauses to give the public a means of inquiring into the accounts of the company.

Mr. Sergeant Wrangham said they proposed to insert a clause that all clauses of the Gasworks Clauses Consolidation Act of 1847, with regard to the amount of profit to be received, should be incorporated with the bill.

Mr. Hill said that would satisfy him; and

The clause was agreed to.

The following clause, with regard to lighting the public lamps, was then agreed to:—"And be it enacted that, from and after the expiration of any existing contracts for the supply of gas to any public lamps within the limits of this act, the company shall afford such supply of gas from any mains within 25 yards from such lamps at a price equal to the lowest price charged to any private consumers."

Mr. Hill then proposed a clause imposing a penalty of £50 for the first refusal, and £10 a day afterwards, in case the company should refuse to supply gas to the public lamps.

This was opposed by Mr. Sergeant Wrangham, and ultimately withdrawn by Mr. Hill.

The next clause, proposed by Mr. Hill, was in reference to fixing the quality of the gas. The clause was framed on the model of that in the Liverpool bill.

Mr. Sergeant Wrangham opposed the clause, which he said was only a corollary to a maximum clause. In this bill, however, there was no maximum imposed, and, therefore, the company had no motive to supply other than the best quality of gas which the materials at their disposal would admit of. In Liverpool there were two qualities of coal—one, cannel coal, supplying a gas of greater brilliancy than that extracted from the black or common coal, which latter alone the Nottingham Gas Company could obtain. Such a proviso would open a road to a very serious evil, as any person or body of persons owing rent for gas had only to raise a question as to the brilliancy in order to obtain a delay, which would necessarily arise from litigating the point in a court of law. There was also another objection, namely, that they could not always obtain the same quality, but were sometimes compelled to make use of an inferior quality. He then called

Mr. Hawkesley, who stated that he considered the principle of a fixed illuminating power objectionable in itself, and particularly so as regarded Nottingham. The coal of the midland districts was of a very variable quality, and they could not always obtain the same quality of gas from the same coal. From other causes also they were frequently obliged to resort to inferior qualities of coal; for instance, about four years ago there was a general strike among the colliers of the midland district, and the company were obliged, owing to the great dearth of coal, to purchase an old abandoned colliery about 25 miles from their works, and manufactured their gas for seven weeks from that inferior coal. Had there then been such a clause in operation as was now proposed they would have been exposed to heavy penalties, through no fault or neglect of their own, as it would have been impossible to have supplied the quality laid down. The Liverpool clause would only apply to cases were cannel coal could be used. Originally the Liverpool companies used black coal, but owing to competition cannel coal was used, and on the amalgamation of the competing companies, from an apprehension of a return to the use of black coal, a quality clause was introduced; that was because it was feared that, there being no inducement to use superior coal, an inferior quality of gas would be supplied, the price of the inferior coal being so much lower than the price of cannel coal. In some cases also inferior coal was more profitable than superior coal; for instance, the rich coals of Scotland produced no coke. There is a mode of measuring the illuminating powers of gas against those of candles. The average brilliancy of the burners in the public lamps is calculated as equal to the brilliancy of from 14 to 15 spermaceti candles of 6 to the pound. In making that calculation, however, many other circumstances had to be taken into consideration. The clause to be definite should fix the rate of consumption of the candles as regulated by the thickness of the wicks and the quality of the material. In his opinion the Liverpool clause was practically inoperative, and, in spite of the great desire of the public to protect themselves against a return to the use of common coal, and their efforts to secure that protection, the company had been too much for them. If a gas company desired to supply gas of an inferior brilliancy and quality there was nothing in that clause to prevent them from doing so. In answer to a question from Mr. Hill the witness stated that the clause as it stood could do no harm, but the consumers might find out its defects and come to Parliament for an effectual clause. He did not say they would do so, but they might. The clause was likely to lead to litigation, although inoperative for the purposes for which it was framed, as when a large debt was due by a public body, and they were unable or unwilling to pay it, they would contest the quality and brilliancy for the sake of the delay and uncertainty which would necessarily arise in trying such a question in a court of law.

The committee decided that the clause could not be inserted in the bill.

Mr. Hill said the last clause he had to propose was one relating to the inspection of meters. It was:—"If the mayor, aldermen, and burgesses of the town of Nottingham shall appoint an inspector of meters, which they are hereby authorized to do, such inspector shall, at any period and at all times, at the request and expense of the consumer, have a right to inspect all meters on giving 24 hours' notice to such company or their clerk."

Mr. Hope, on behalf of the petitioners, objected to the clause, and proposed to call Mr. Hawkesley for the purpose of showing that it was not needed.

Mr. Hawksley was then called and examined.—He said he had seen the clause proposed by the opponents to the bill. It was the first time he had ever known such a clause to be proposed. He knew of no such clause existing in any act of Parliament. As a matter of practice he did not think the public needed any such protection. He knew that the company, and not the public, were the only losers by the present mode of admeasurement.

Mr. Hawkesley here produced two specimens of meters to show the mode of working, and explained the different parts. He said that the less water there was in a meter more gas was allowed to pass through than was actually registered, so that the consumer got more gas than he paid for. Therefore, as the meter was immediately in the possession and under the control of the consumer, he could guard himself against any loss, which the company had not the same power of doing. In both wet and dry meters the principle consisted in registering the quantity of gas passed through a series of valves. Water was the best valve, as it was always close; the defect of the dry meters is that the valves do not always continue close, and, from the deposition of water by the gas, which always contains a certain portion of moisture, the meter gets so humid that it will not operate. The meter used by the Nottingham Gas Company, and which is manufactured by Messrs Crosley, cannot rob the consumer, as he always has the remedy in his own hands, but it may rob the company. They sent their inspectors round twice a quarter, however, so that their loss was only 11 per cent. per annum, while some companies lost 32 per cent. He considered wet meters better than any dry meter yet invented. There was no necessity for the proposed inspection for the protection of the consumer. He thought great inconvenience would result from such a proposition being carried out, as advantage would be taken to call in these inspectors merely for the purpose of delaying payment of accounts. The consumer need only take out a plug, fill up his meter so that it should register wrongly, and call in the inspector, and the company could never detect him. The matter, if brought into a court of law, would only be a question of evidence between the consumer and the company's servants. The water might have been below the water line in the chamber of the meter all through the quarter, and be filled up the last day.

Mr. W. Brown: But if you took care not to fill it above the water line you would detect the attempt?

Mr. Hawkesley: Yes, but that would be a question of evidence. Besides, there is sometimes an excess of water deposited by the gas itself if the meter be placed in a very cold situation. There is always a small quantity of water present in gas. The consumer can, however, always remedy that by letting off the superfluous water. The witness then explained the mode in which the returns exhibited on the dial-plate were entered in the dial-book and checked. A hole in the measuring-chamber of the meter would permit the gas to pass through without being registered, as the gas would not turn the wheel. If the meter were overfilled and kept so it would give less gas, but, if that were the case to any extent, there would be a sensible difference in the lights, and it could be at once remedied. The utmost variation that could be produced by a superfluity of water without stopping the flow of gas was only 4 per cent.; above that per centage the diminished supply of gas would make itself at once perceived. The company had this protection, that the water could not be let off below a certain height [without injuring the meter]. However, they did not meet with many rogues, and he did not consider it would be inconvenient for the public to know as much about meters as he himself did.

John Cooke, an inspector in the company's employ, was next called.—His duty was to go round and adjust the company's meters. His instructions were to adjust the water in the meters to a certain height, which he always did.

Mr. Hope said their objection to the clause was that it was unnecessary, would lead to inconvenience, and was without precedent in any former act of Parliament.

Mr. Hill having replied,

The committee resolved to admit the clause, but suggested that the period of notice should be extended to 48 hours. Agreed to. It was also agreed, on the suggestion of Mr. Hope, that the inspector should be appointed by the recorder of Nottingham, instead of the mayor, aldermen, and burgesses.

Mr. Hope proposed, as an amendment rendered necessary by this clause, a clause to the effect that the party making application for inspection should deposit any sum due by him to the company in the company's hands, the balance, if any, to be restored after the decision of the inspector.

The Chairman said it would be better for the money to be deposited in the hands of the inspector. This was agreed to, and the clause inserted. The proceedings on the bill then terminated.

Hartlepool Gas and Water Works Bill.—Mr. Hope stated the case for the promoters of this bill, which was for the purpose of extending the powers of the Hartlepool Gas and Water Company, to enable them to purchase certain springs, &c., and to purchase the works of the Hartlepool West Harbour and Dock Company. The Admiralty and the Board of Woods and Forests had given their assent to the bill on certain conditions, which the company agreed to, and the only opposition offered was on the part of the trustees of the Duke of Cleveland, Lord Brougham and Vaux, and another, who objected to the company's water-pipes passing through their grounds in a certain direction. Sir Walter Riddell, in their behalf, proposed an arrangement which the promoters consented to take into their consideration, and the committee adjourned for the purpose of giving time to come to an understanding.

MARCH 21.—SEVENTH DAY.

Mr. Hope stated that, although there would be some delay in carrying out the proposition of the other side, they had been willing to take it into consideration. He had, however, been informed that it was a *sine quâ non* that his clients should pay the costs of the proceedings. This they declined to do, and therefore they must go on.

Sir W. Riddell thought his clients were perfectly right in demanding costs, and could accede to no proposition not including them.

Mr. Lawrenceson, brewer, of Hartlepool, was called, and stated that the supply of water at Hartlepool was very deficient for the wants of the town. The population of the town and districts immediately adjacent is nearly 9000, and the only means of obtaining water was from three springs in the neighbourhood, and the town was supplied by four waggons and three carts, which fetched from 4000 to 5000 gallons a day, for which 1d. for every 6 gallons was charged; that was a most insufficient supply. He had calculated that by the proposed plan of the Hartlepool Gas and Water Works Company he himself would save £70 or £80 a year in the cost of water.

Thomas Bird, currier, of Hartlepool, gave similar evidence.

Mr. J. Simpson, engineer, called.—He stated that the supply of water at Hartlepool was very deficient. The consequence was that disease and filth abounded in Hartlepool. There was no supply for putting out fires except direct from the sea, and any fire occurring would have to be left to burn out. The spring from which the company proposed to bring their water was called the Old Quarry spring. It yielded 700,000 gallons a day. The company proposed to supply 1369 houses with 130 gallons a day, the West Dock Company with 25,000 gallons, and 75,000 gallons for sanitary purposes. The water would be supplied from a reservoir, and would be constant in quantity. The capital proposed to be raised was £25,000, being £19,000 for the purchase and formation of waterworks, and £6000 for the extension of gasworks. The objection made by the Admiralty was to laying down pipes across the Slake, an estuary at the mouth of the harbour, and they proposed conditions to secure the proper scouring of the Hartlepool Dock, for which the Slake was used, and for the contingency of the Slake being converted into a dock at any time. He saw no objection to clauses that if pipes were laid down across a dock it should be so done according to Admiralty plans. He proposed to lay the pipes across the Slake at a depth of 4 feet, but, if required, he would not object to dip 30 or 40 feet. The sum of £9000 is to be paid for the West Harbour Company's reservoir. These reservoirs were about 40 feet in diameter. The bill of 1846 constituting the Hartlepool Company provided for the making a reservoir of 15 acres. [The company had never been able to carry out their powers under that act as far as regarded waterworks, owing to the opposition of the parties across whose property they would be compelled to lay their pipes.]

Mr. Gray called.—He was one of the directors of the Hartlepool Gas and Water Works Company. Had had an interview in 1847 with Mr. Bowdlam and Mr. Allport, the agents, as to the terms on which the company should be allowed to take water from the Dyke-house spring, but could not get them to name any sum, and no sum had yet been named. Was aware that the spring was leased to the Hartlepool Dock and Railway Company, but they were to have the surplus water. He dealt with them as agents for the owners of the soil. The company had powers to take water from the Heartburn spring, but only at a point where it was practically useless. They had frequently applied in writing to Mr. Bowdlam to name a sum for leave to take water from the Dyke-house spring, but they had had no answer. Mr. Allport, for the Dock Company, was willing to consent to their propositions, provided they could agree with the agents for the trustees of the Duke of Cleveland.

Sir Walter Riddell addressed the committee on the behalf of the petitioners, the trustees of the Duke of Cleveland. There was no doubt that there was a great want of gas and water in the town of Hartlepool. The only question was as to the terms on which the trustees should accede to the proposition of the company for obtaining their supply of water from springs belonging to the estate, and the mode of conveying it to the town. He thought the proposals made by the trustees were fair and reasonable. He argued that the line laid down by the company for the course of their pipes would interfere with the increase of the prosperity of the town, by preventing the formation of docks, and trusted the committee would be satisfied that the application should be negatived.

The committee, after a short deliberation, declared the preamble proved.

The clauses of the bill were then gone through *seriatim*, and agreed to with trifling alterations, with the exception of the Admiralty clauses and the clauses proposed by the opponents, the consideration of which was adjourned to Friday.

MARCH 22.—EIGHTH DAY.

Present, Mr. Ker Seymer, chairman; Mr. W. Brown, Captain Boldero, Mr. Somers Cocks, Mr. Pole Carew, Mr. Masterman, and Mr. Pattison.

Great Central Gas Consumers' Bill.—Mr. Hill, Q.C., Mr. Edwin James, and Mr. Pitt Taylor appeared on the part of the promoters of the bill; and Mr. Talbot, Q.C., Mr. Hope, Q.C., and Mr. C. Smith, on behalf of the petitioners against it. Mr. Hill proceeded to state the case on behalf of the promoters of this bill, which he stated was a matter of great importance to the citizens of London, as if carried out it would save them a sum of £46,000 a year in the cost of their gas. The city of London was only one square mile in area, while the parts of the metropolis beyond the walls amounted to 65 square miles, so that, comparing area with area, it might appear that, as far as regarded gas, the City must be a mere spot in the map. However, if they went a little further into the calculation of consumption, the matter would be materially changed. The present consumption of the City was about five hundred and twenty million cubic feet a year; and, by the rule of proportion, that being the consumption of one sixty-fifth part of the metropolis, the whole consumption would be enormous; but, making allowances for less denseness of population, they would still get a total of one thousand eight hundred million. Of course that was not the real consumption of the metropolis, and if they entered on the inquiry he should be able to show that the consumption of the other parts of the metropolis was only five-sixths of the total consumption, or only 5 times instead of 65 times as much as the consumption of the City. He insisted on that fact, because in a former inquiry they had been made aware of the great importance of concentration. Another fact of great importance was the relative number and consumption of the public lights as compared with private lights, inasmuch as the committee had laid down

the principle that the public lamps should not be supplied at a lower rate than was charged to private consumers generally. The public lights in the city of London, he should be able to prove, were 2678 in number, which consumed fifty-two million cubic feet per annum, so that they got this important fact, that the amount of gas to be supplied at a lower rate was only one-tenth of the whole consumption. The uniform price throughout the metropolis was 6s. per 1000; but the price charged for the public lamps was only 4s. 0½d., which included the cost of lighting, cleaning, and repairs. Therefore, adding these prices together, in proportion to the actual quantity on which each price was paid, they found the average sum to be 5s. 8¾d. Much stress was laid out of doors on the part of the City companies on the equality of prices in and out of the City, but he challenged his learned friend on the other side to show that the companies out of the City received more than 4s. 8¾d., for he was prepared to show, *in limine*, that there was a fallacy in saying that the prices were equal. The number of public lamps in the City he had stated to be 2678, but if they assumed that the total number throughout the whole metropolis was in proportion they would be in error; for in the City the lamps were more numerous, yard for yard, than out of the City, they being more thickly spread over the streets. But, assume the lamps in the City as being three times more thickly spread than out of the City, then the number of lamps for the metropolis would be 60,000. As regarded the proportion of consumption he believed his learned friend would not dispute his accuracy in saying, that out of the City the relative consumption of the public and private lights was about equal, instead of being as 1 to 9, as in the City. So, then, calculating the average on the principle before laid down, they would find that the real price out of the City was 4s. 8¾d. But out of the City, again, the price charged was lower, considered with regard to the expense of distribution, than in the City. Take the Strand, for instance, in a mile of that thoroughfare, from Temple-bar to Piccadilly, he believed he should be able to show the consumption was not more than £2000 a mile of main for public and private lamps, although there were three sets of mains, while on the other side of Temple-bar, from there to the Minories, consumption was £2000 or £3000 a mile, although only one set of mains was laid down. The moment they passed Temple-bar the consumption increased more rapidly, and the concentration was greater than outside of it. Confining himself to the question of concentration, he could show that if there were only one company outside of the City the diminished quantity of mains would have an enormous effect on the price of gas. In general the expense of mains was about two-thirds of the total outlay. In the estimate of the outlay at Nottingham £48,000 was put down for mains, while only £10,000 was put down for plant and works. In the city of London, however, he should be able to prove that the cost for mains was only one-half of the total outlay. Another great advantage arising from concentration was the diminished amount of leakage, owing to the smaller quantity of pipe which the gas had to pass through. The difference of the proportion of leakage in the City and out of it was, as he should be able to prove, enormously great. He now thought he had shown good grounds for the principle that the inhabitants of the city of London should be supplied with gas at a lower rate than those out of the metropolis—first, on account of the fewness of the public as compared with the private lamps; secondly, the great saving of capital in the outlay for mains; and, thirdly, the great saving in the item of leakage. The people of London suffered the disadvantages of concentration, and surely ought also to enjoy the advantages. It was not surprising that, under these circumstances, which were open to the observation of all, a feeling should have grown up among the inhabitants of the city of London that they were not fairly and justly treated by the two companies to which they were obliged to apply, and which had a complete monopoly of the supply of gas in the City. Strong efforts were made by the consumers to induce the companies themselves to lower their prices; but the companies chose to turn a deaf ear to that very reasonable desire on the part of the consumers, who were consequently driven to find other means of obtaining what they considered justice. Numerous and highly respectable meetings had been held throughout the metropolis, and ultimately the consumers combined themselves into an association for the purpose of obtaining relief. The corporation was applied to, who referred the matter to the Court of Sewers, by whom a commission was appointed to consider the matter, and it was resolved to apply to Parliament for powers to erect gasworks, &c. This determination, however, was abandoned, it not being considered advisable for the corporation to entangle itself in the manufacture of gas or any other article. The bill which had been prepared was therefore abandoned. The consumers then resolved to form themselves into a company for the manufacture of cheap gas, and the committee had a petition on behalf of the company now applying, signed by from 4000 to 5000 of the most respectable inhabitants of the city of London, whose united consumption of gas amounted to £86,000 a year, which, at 6s. per 1000 cubic feet, represented nearly one-half the total consumption in the City. The committee had already had before it Mr. Angus Croll, and that gentleman had taken on himself the responsibility of supplying the inhabitants of the city of London with gas at 4s. per 1000, under the conviction that he should be able to supply gas at that price at a handsome profit. He had formerly been connected with the Chartered Gas Company in Brick-lane, and afterwards leased the Coventry Gasworks at a profit to himself and the shareholders, and had since been connected with the establishment of gasworks at Tottenham, so that his experience could not be denied. The capital proposed to be raised by the company was £250,000, a sum sufficient for producing seven hundred and sixty-three million cubic feet of gas. At first, however, they did not calculate on any immediate necessity for raising of more than three hundred and six millions, or, allowing for leakage, three hundred and sixty-eight millions. This capital would be allocated as follows:—Expenditure of capital for raising three hnndred and sixty-eight million cubic feet of gas: purchase of gronud, £20,000; manufacturing plant and apparatus, £26,855; gasholders, £15,000; mains, service-pipes, and meters, £72,516—(he would here mention that the company proposed to include the rent of meters in the 4s.)—ten per cent. for contingencies, £13,758; preliminary expenses, £8,000: total, £164,808. They had, however, taken £250,000 to meet the increased demand that would be caused at a future period by the impetus given to consumption by this reduction, and then most of these items would have to be doubled. He would next consider the case of the gentlemen who opposed this application. There were four petitions against it on their table. Of the first, by the commissioners of sewers, he should say nothing, as they only petitioned for the object of giving them a *locus standi* in the committee; two other petitions were from the Chartered Gas Company and the City Gas Company. The learned gentleman here entered into a long review of the history and constitution of these two companies, and contended that any opposition on their part was most ungracious. He then argued that the deposit of the subscription contract, which, it would be alleged on the other side, was necessary before the committee could take the application for a bill into consideration, was not needed for that bill, inasmuch as it contained no compulsory clauses. He had adverted to that point then because on looking into the acts of these companies he found they themselves had not one-half of their capital raised until the act was passed. The last petition was from 134 bankers, merchants, and inhabitants of the city of London, certainly a very small number to oppose to the petition he had referred to of 4768 inhabitants of the city of London in favour of the proposed company. It was stated in the petitions of the existing gas companies that there would be great inconvenience in taking up the pavement of the streets for the purpose of laying down fresh mains, and that the introduction of a new competing company would be productive of no benefit to the public, as, instead of competing in favour of the public, they would in a short time combine with the old companies against the public. These were the only two allegations deserving of notice in the three petitions against the application. In answer to the first, he would state that the company proposed to insert a clause binding them not to take up or lay down mains except between the hours of eight at night and seven in the morning. To the second allegation he would reply by stating that the company were willing and wished to bind themselves to a maximum price of 4s. per 1000 cubic feet. Mr. Hill next adverted to the letter sent by Mr. Tyrrell to various gas companies throughout the kingdom, to the effect that such companies were probably aware that a bill was pending in Parliament promoted by the Great Central Gas Consumers' Company, the professed object of which was to secure cheap gas, and that a clause was inserted in the bill imposing a maximum price of 4s. The company had not at present any works, and sought to establish themselves in the district at present lighted by two of the metropolitan companies. The letter went on to say that, as that attempt concerned not only the metropolitan gas companies but also gas companies generally, a pamphlet by a skilful engineer was enclosed which seemed to deal with the question in the fairest possible spirit, and in which data were given disproving the assertion that the price of gas was too high. As that principle (the letter continued), when once established, must extend throughout the kingdom, he (Mr. Tyrrell) was sure they would be anxious to give their support and assistance in opposing the bill, and he requested them to be so good as to put their local members in possession of the real facts of the case, and either request their assistance or permit him (Mr. Tyrrell) to communicate with them under the sanction of their authority. Mr. Hill then inquired whether the committee had seen the pamphlet?

Captain Boldero: Yes, we have three or four of them.

Mr. Hill: Then I hope you have read it, and you will see the fairness which is to be found in it. That pamphlet is written for the purpose of supporting the existing gas companies, the author of which would, probably, be called before them as an independent witness. We shall, however, have an opportunity of cross-examining him, unless my learned friend should shrink from calling this skilful engineer whose name is perfectly known to me—I suppose I may give his name—Mr. Barlow: he is the civil engineer whom I presume my learned friend will call; and unless he shrink from putting him into the box—I see him now in the room—I expect to have some conversation with him to-morrow. I will now show you some samples of the fairness with which this pamphlet is written. As an instance of the general unfairness which runs through the whole he would mention (Mr. Hill continued) that the figures and calculations of the price of gas were based on the returns of the whole metropolis, and not of the city of London. Now, the question was not of the prices all over London; and he would show them how absurd those calculations were when applied to the City only. Whether they were right or wrong, as applied to the metropolis at large, was a matter with which he had nothing to do. He puts down the cost of cleaning, lighting, and repairing the street lamps at 3d. per 1000 feet, and then applies that sum, not to the consumption for the public lamps only, but to the total consumption, public and private, together. Now, let them see what that came to in the city of London, where the total consumption was five hundred and twenty million cubic feet, and the number of public lamps 2758. Putting down 3d. per 1000 among these public lamps, and they got £6250 a year for cleaning, lighting, and repairing, or nearly £2 a year per lamp, the actual cost being in reality only 15s. That was one of Mr. Barlow's beautiful discoveries, for which he might take out a patent if he liked, though he did not think any one would pirate it. As he had said, the actual cost was 15s. per lamp, which, on 2758 lamps, amounted to £2008. 10s., so that the difference between the actual charge and Mr. Barlow's calculation was £4241. 10s. for lighting the lamps in the city of London. That was one item. Now take the cost of directors. They thought it an ample provision if they put down for directors £2000 a year, but Mr. Barlow put down £3645 for directors, or 1½d. per 1000

feet. Was not that monstrous on the face of it, looking at such an enormous consumption as that of the city of London? These instances might be multiplied *ad infinitum*. This gentleman also says that the consumption of gas all over the metropolis is about equal in both the public and the private lights, so that, taking the price of one at 3s. 10d., and the price of the other at 6s., the average will be 4s. 11d., so that on their own data, as recommended by themselves, the City Company charged 1s. more than a fair price. On five hundred and twenty million feet that would amount to £26,000 a year, a sum worth fighting for. He had pointed out some of the discrepancies in that pamphlet. Let Mr. Barlow, if he will condescend so far as to take a suggestion from him, calmly consider the matter. He would not take him unawares in the witness-box, and he would, therefore, advise him to see how he could reconcile conflicting statements. There could be no pretence for calling that gentleman a fair witness on the ground of freedom from prejudice, and he would like to speak with him and ascertain how it came to pass that the pamphlet came under the protection of the Chartered Gas Company, and was by them so largely diffused. And Mr. Barlow was pledged to come forward, because he says these figures are capable of being proved in evidence, and would be so proved in any committee of Parliament assembled during the present session. The only debateable charge Mr. Barlow stated was that for deliberation, "for which (Mr. Barlow says) I think the gas companies never allow enough," so that, in fact, the companies ought to add to their charges. Again, in page 23, after complaints of the money laid out in experiments by the Chartered Gas Company, Mr. Barlow admits that the whole amount so expended had subsequently been repaid beyond the dividend of 6 per cent. to which the company had limited itself. Some portion of that money had, in fact, been expended, not in experiments, but in opposing those who had attempted to invade their secured monopoly. The learned gentleman concluded his address by urging the committee to grant the powers asked for by the company, on the grounds he had stated, and which he believed were sufficient.

The first witness called was *John Dillon, Esq.*, of the firm of Morrison, Dillon, and Co., warehousemen, Fore-street, Cripplegate.

Previous to the commencement of the examination, the CHAIRMAN asked Mr. Talbot (who appeared for the petitioners against the bill) whether, if there was likely to be any discussion on the question of the production of the subscription contract, it had not better be gone into at once, to save useless waste of time?

MR. TALBOT, however, said he could not regularly take that course at present. He should have an opportunity of cross-examining the witness, and would then raise the question.

The examination of the witness was then proceeded with. He detailed the agitation that had arisen in the City on the question of cheap gas, and stated that numerous meetings had been held of the various City wards to consider the subject. He was chairman of a meeting held at the City of London Tavern on the 21st of February, and was appointed one of a deputation to wait on the boards of the two City gas companies to urge them to lower their price. Interviews accordingly took place, and ultimately the boards stated they could give no positive answer on the question until after the 5th of April, when their accounts would be made up. That answer was reported to the consumers at a second meeting, held on the 14th of March. He knew nothing of any new company until that second meeting, when the consumers were urged to take shares in the Central Gas Consumers' Company. Mr. Wire and Mr. Charles Pearson were present at those meetings. At the second meeting he himself said that, the companies having refused even to listen to the representation of that meeting, he saw no other mode of relief but in taking part in a new company, and he felt some reluctance in recommending that course, as, from the objection he felt in taking any part in joint-stock companies, he could not himself take shares in the company proposed to their consideration.

The witness was then asked by MR. TALBOT whether he had seen a paper which he held up?—*Mr. Dillon* answered that he had seen it that morning.

MR. TALBOT: Is is true that that is the statement of the promoters of this company, saying that they still want 4000 consumers' shares to be subscribed, which must be taken before the 24th instant, and the deed signed, or else it will be void, according to the contract deed?—Ans.: I do not know.

MR. TALBOT: Have you seen the contract deed?—Ans.: Yes, in a printed paper.

MR. TALBOT: I call for the production of that contract deed.

MR. HILL declined to produce it.

The point was then argued by counsel whether the contract deed should be produced at this stage of the inquiry or not, Mr. Talbot applying to the committee to call on the promoters to produce the subscription contract; and Mr. Hill contending that he had the right of producing it at any stage of the proceedings he might think advisable.

The room was then cleared, but, the committee being informed that the Speaker was at prayers, the deliberation of the point was adjourned until to-morrow.

MARCH 23.—NINTH DAY.

The *Hartlepool Gas Bill* was agreed to, the clauses proposed by the petitioners against the bill having been rejected.

The committee then proceeded with the consideration of the *Great Central Gas Consumers Bill.*

The CHAIRMAN stated that the committee had resolved not to call on the promoters to produce the subscription contract at this stage of the proceedings. If, when the promoters were giving proof of their ability to carry on their works, they were able to put that deed in, it would be advisable, as it would be more convenient, that that part of the case should be gone into as early as possible, as there would be less inconvenience than by allowing the question to arise on cross-examination.

Mr. Dillon recalled, and cross-examined by MR. TALBOT.—Did not discuss the question of quality in the interview which the deputation of gas consumers, of which he formed one, had had with the two gas companies. They did not consider themselves competent to discuss the matter, and said all they came for was cheap gas. At the meeting of the 14th of March several speakers said their movement was only for cheap gas, and they did not care by what system their object was effected. At that meeting a gentleman named Bovill spoke of a plan for bringing gas by pipes from Wales to London and supply it into a company's gasholder at 3d. per 1000 feet, but the cost of distribution he estimated as 1s. per 1000 feet. At the same meeting Mr. Charles Pearson spoke of this company, and said the price would not always be 4s. That was the maximum price, but they would soon have it down to 3s., which would still pay a dividend of 10 per cent. Had not at that time taken, nor intended to take, any shares in that company, but Mr. Croll had called on him and induced him to take ten shares. Had not signed the contract deed yet, but had entered into an agreement to take ten shares at a future period. Mr. Croll told him that the whole number of shares was 25,000, of which it was necessary one-half should be subscribed at once, but from 4000 to 5000 of the half were still unsubscribed for. He had read the contract deed a fortnight ago. He had felt considerable reluctance in taking these shares, as, in common with many other tradesmen in the City, he was greatly disinclined to join any joint-stock company. He had only taken those shares because he felt convinced that no relief was to be expected from the old gas companies.

The CHAIRMAN: What is your opinion of Mr. Bovill's plan?—Ans. I should have thought it a very absurd thing formerly, but, after the success of the electric telegraph, I should be surprised at nothing.

Mr. John Hall, linen-draper, Bishopsgate-street, examined.—Was a member of the Common Council, and also one of the commissioners of sewers. He used gas all over his premises. The extent of his gas consumption was 70,000 or 80,000 feet a year. He was supplied by the Chartered Gas Company. He had directed his attention to the question of gas, and believed it probable that cheap gas could be supplied in the City at a profit. The mode of meterage was entirely in the company's own hands. The meter was purchased by them or the consumer, but it was entirely under the control of the company. The consumer was not allowed to meddle with the meters, and if there were anything wrong about them he was obliged to send to the company. One quarter he had been overcharged for 7000 feet, which he was compelled to pay for. He thought it would be advantageous for the consumer to have an inspection of meters by some third party. The quality of the gas supplied had been very bad since February, it being dark and opaque; lately, however, it was better. The area of the City was less than the area of the metropolis beyond the walls, and that would enable a company to supply gas cheaper in the City than out of it. The cost of the distribution was one of the chief elements in fixing the price of gas. He considered 6s. a very high price in the City. He thought the scheme of the new company possessed very great public advantages. If gas could be supplied at 4s. equal to what is now paid 6s. for, it would be a great public benefit. He had no doubt in his own mind as to the success of the company. He looked especially to Liverpool, where the gas is relatively worth 14s. as compared with the London 6s. gas, and yet they only pay 4s. 6d. He took that comparison from the report of the Liverpool case. He was in fact merely quoting that report. Had been in Liverpool, and had remarked the brilliancy of the gas; but the absolute relation it bore to the brilliancy of the London gas he took from that report. He considered 6s. a high price in London because better gas was supplied elsewhere for 4s. 6d. He did not state that from his own knowledge, but from comparing the returns in Mr. Hume's report. Liverpool was one place on which he founded his comparison. There was no town in the kingdom possessing greater advantages for the supply of gas than the city of London. Had not taken the price of coal as a material element in the price of gas, as where coal was high-priced, as in London, the residual products were also higher. He did not know what cannel coal would cost in London; the price in Liverpool was 20s.; in London it might cost 4s. or 5s. more. In going through the comparison between these places he had laid aside the consideration of the different local circumstances of each place, as he considered they had no influence on price. The amount of consumption had a very great influence. Thought wherever they made their gas the prices would be the same where the consumption was the same. Extent of consumption was the only test of the cost of production. His own house was situate on the verge of the City, one corner being beyond the City bounds. Had lights in that corner as well as in the other parts of his house, and there was a difference of 2s. between the charge made for the gas consumed in the City and that consumed out of it, although supplied by the same company. When he complained of the high price charged in the City, and mentioned that circumstance, he was immediately charged the lower price for all his gas. That was by the Chartered Company in 1846. When the Commercial Company came into existence, which he thought was about the early part of 1846, they canvassed him for his custom. They had mains close to his house ready to supply him, but he stuck to the Chartered Company all through. Did not know what the Commercial Company were now charging. Had no choice now, as an arrangement had been come to between the companies, by which he was compelled to take the Chartered Company's gas, it being arranged that the Commercial Company should not supply gas in the City, and the two lights he had in the corner of his house out of the City were cut off, and the fittings attached to the other end. When the Commercial Company was started, offering to supply gas at 6s., the Chartered Gas Company were charging 8s., but they soon after reduced their price to 6s. There was a great outcry at the time about the high price of the gas. There was no competition at present between those two companies. They divided the districts between them, and competition ceased. But when the Commercial Company first came into existence there was considerable com-

petition. Was aware that great agitation at present existed in the City on the question of cheap gas. Had not gone about personally amongst his fellow-wardsmen on the subject, but had met them at meetings, and in committees, and had spoken with them about it. Had agreed to take five shares in the new company. Had done so after the bill was before the committee. Had seen the deed, but it had not been in his custody. Had gone about with the deed in company with Mr. Barham, the secretary, to procure subscriptions, as one of the committee, who, it was agreed, should individually give each a few hours' time to accompany some person with the deed to those who had promised to sign it for their signatures. Went about in his own ward to obtain fresh subscribers. Had travelled about nearly two hours and a half on Saturday morning for that purpose. Could not say how many subscribers he obtained on that occasion, nor the total number of shares they took. Obtained, perhaps, fifteen or twenty names, varying from five to ten shares each. Could easily point out the subscriptions he had procured in the subscription contract. Mr. Dillon was a member of the committee, but not of that part of the committee which agreed to take shares. Was obliged to take the company's meters: there was no option. They were allowed to purchase them. Was not sure whether they were not allowed to purchase meters of any one but the company. Had purchased his meter from the company. It was a wet meter, with a plug in the side within his reach. Had frequently taken it out when the meter required water to be added to it. They sometimes had the lights go out for the want of water. Generally sent to the company to send the man down when that was the case. Never took any water out. On one occasion the meter registered 7000 more feet in one quarter than in any other quarter. That was in the quarter from Christmas to Lady-day, 1847. On that occasion the meter was taken away and brought back again. Had never had occasion to find fault with it before or since. Was not aware of any instance in which a person had discontinued the use of gas after he had once adopted it, owing to his being dissatisfied with the price or quality. In fact they could not do without it. The Chartered Company first reduced their price from 8s. to 7s., and afterwards to 6s. The price was 8s. when the Commercial Company first came into the neighbourhood. They were in a condition to supply him with all his lights. He did not give them his custom because he would have had to disturb all his gas-fittings; and besides, if the old company who had always supplied him would put him on the same terms, he was unwilling to discontinue them. They did so, and they reduced his price to 6s. Those of his neighbours whose premises were in the same position as his own, that is abutting out of the City, were also lowered to 6s.; but those on the other side of the way, who were not in the same position, were continued at 8s. The Court of Sewers were almost unanimously agreed on behalf of the cheap-gas movement. It appeared from the papers laid before the Liverpool committee that the price of coal at Liverpool was exactly the same when gas was at 10s. as when it was at 4s. 6d. No movement was made by the consumers for a new company until the old companies had refused to supply cheaper gas. The commissioners of sewers had an interview with some gentlemen on behalf of the old companies, and they asked them to lower the price of their gas. They said they could give no answer then; and wished the commissioners to give them some data that would show them that it was possible to lower the prices. The 5th of April was named as the day when the companies would give an answer. Mr. Gray was there for the City Gas Company. The commissioners of sewers had prepared a bill for the purpose of enabling the corporation to manufacture gas; but the corporation were advised not to proceed with it. The plan was to raise capital by mortgaging the rates. There was no maximum clause in that bill. With respect to the 7000 feet overcharged, he had to pay the whole, because the inspector said his price was under that of his neighbours. One of his neighbours was charged 10,000 feet too much; but in that case they took off one-half. Several of his friends refused to take shares in the new company on the ground that they were unwilling to join a joint-stock company. Many were willing to take the gas, but would not take the shares. They were willing to enter into a contract to bind themselves to take the gas if the company were formed. The first plan of the commissioners of sewers was to obtain a bill enabling them to manufacture their own gas, with power to purchase the works and mains of the existing companies. The remembrancer, however, said that any proposal for manufacturing and supplying gas by the corporation would not meet with the sanction of Parliament. His name was Tyrrell, and he was the brother of the gentleman of that name at the table. He started the objection, and so that bill was got rid of.

Mr. W. Brown: Is the paving and sewerage of the City under the same management?—Yes.

Mr. W. Brown: Would any peculiar difficulty arise if mains were laid down between the hours of six in the evening and seven in the morning?—No; there would be no inconvenience if they were laid down in that way.

Mr. Talbot: Do you know whether there is a clause in the act constituting the Court of Sewers to the effect that it is illegal to lay down mains at any other time than at night?—No; I am not aware of such a clause.

Mr. Caldicott was then called.—Stated that he was a large Manchester warehouseman in the City. Had formed one of the deputation that had waited on the gas companies for the purpose of inducing them to lower their prices. Kept a large wholesale house, and was urged forward by his retail customers to enter into the movement. The cost for gas for many of them was one-half their rental, as they burned to a late hour in the evening. Had felt peculiar reluctance to join the new company, but had taken ten shares in it as he thought it was for the public interest. Several large houses had called on him that morning, and stated their intention to take shares. Cook and Co., and Collard and Co., were amongst them.

Cross-examined.—Thought it a good speculation, the dividend being 10 per cent. Had held railway shares in the Manchester Direct Railway Company. Took them because he thought the prices charged for carriage by the existing railway company too high. The new gas company would not have been formed if the old companies had shown any symptom of meeting the wishes of the consumers. Was aware that the last reduction was in April. And he would have waited till the time mentioned by the company had he not learned that they were charging two sets of prices. Was aware that the low price was for the public lights. Did not know that there was a clause binding the present proposed company to supply the public lights at a lower rate. He would not say whether, if that were so, it was unjust; that required calculation. The injustice would be much less at 4s. and 2s. than at 6s. and 3s.

Re-examined.—The competition amongst the retail trades of London was such that every economy was necessary to secure success. Many persons who had declined to take shares were willing to pledge themselves to take the gas for five years.

Mr. W. Brown: Is the gas of the London companies ever of such an inferior quality that persons were obliged to use candles instead?—I never heard of such a thing.

Mr. W. Ficklin was then called, and stated that he was a tailor and draper residing in Bishopsgate-street. Made similar statements to those made by former witnesses as to the agitation in the City on the subject of cheap gas. Used the company's meters, for which he paid 6s. a year. Last year he paid 4s. The price of gas then was 7s. When the Chartered Company lowered the price of their gas they raised the rent of their meters. That was not the case outside of the City. Was not aware that he had any control over the registration of the meter. There were cocks in it which might be opened and water poured in or taken out; but had never interfered with it. Had conversed with his neighbours on the subject of cheap gas.

Cross-examined.—Was honorary secretary to the Central Consumers' Gas Committee. Had gone about amongst his neighbours, who expressed considerable dissatisfaction at the high price of gas. (Mr. Talbot here showed the witness a pamphlet.) Had seen that pamphlet. Had something to do with the issuing of it, but had not authorized the printing. The facts were taken from various sources. Mr. Machin, of Bishopsgate-street, was the compiler. The pamphlet said that the Croydon cost price of gas is 2s. 6d. per thousand. Had sanctioned that statement. It was contained in the minutes of evidence taken before the Croydon Gas Company. He found it in Messrs. Patten and Cox's evidence. Mr. Cox said the charge was 7s. per thousand.

Mr. Talbot: But you took the answer to the question, "Can you give us the prime cost of 1000 cubic feet of gas?" the answer to which is, "That is exactly 2s. 6d. per 1000 feet delivered to the consumer." Then that does not represent the actual cost at Croydon. Do you remember his being asked whether the difference between 2s. 6d. was entirely profit? And the answer was:—"Yes; and you will find that it will only pay 7½ per cent. on capital invested, exclusive of dividend and the interest of money. My estimate of 2s. 6d. per 1000 cubic feet delivered is made up of the following items:—1 ton of coal, at 24s., producing 10,000 feet, makes a cost upon the gas of 28·8d.; labour and tools, 5½d.; lime, ·7d.; repairs of works, mains, retorts, and services, 5½d.; making a total of 40½d. On the creditor side, by the products which I stated just now at 15s. per ton, the coal will make 18d.; the gas refuse will be 4·5d., which makes 22·5d.; 10 per cent. for leakage will make it 24·75d.; salaries and taxes at 5·25d.; making a total of 30d. Now, these being my totals, I calculate that ten millions of gas will cost me, at that rate, £1250; that brought out in separate items, as required by the act, makes wear and tear, £252. 1s. 8d.; consumption, £1352. 1s. 8d.; labour, £252. 1s. 8d.; salaries and taxes, £218. 15s.; making a total of £2075, from which I deduct £825 for coke and tar, making £1250 the cost as before. Now for my receipts:—On the other side, I have for the public lamps, less repairs and the cost of lighting them (and the cost of lighting them here is less than at any place I have been at; they have £3 for lighting each 300 lamps), £684; then I have 4,500,000 feet private consumption, £1578, making a total of £2259; to which I add for rent, &c., £60, making a total of £2319; from which I deduct £1250, the cost, which leaves a balance of £1069 to pay 7½ per cent. upon the capital expended, which will be £14,000, leaving me only £19 for bad debts. The reason of all that is that I sell the public 5,500,000 feet of gas at a dead loss, while I only sell 4,500,000 at a profit." Now, from that mass of evidence, you have only taken that exerpt of the prime cost being 2s. 6d.?—Yes.

The witness was then examined on the subject of the meters, and recapitulated what had been before stated.

Re-examined by Mr. Hill.—With regard to Cox's evidence, he says the cost of coal in London is 17s. per ton; by the time it gets to Croydon it costs 24s. With regard to public lamps, Mr. Cox said, "I supply 5,500,000 feet of gas for public lamps at 2s. 6d. per 1000 feet; that would cost cost me £2. 10s., and the lighting would cost me 14s. 6d.; that would make it £3. 4s. 6d.; the net cost, independent of interest of capital, for which we receive £3, making a loss of 4s. 6d. per light in 300 lamps. We have to make a profit only upon 4,500,000, for which we make ten million of gas; so that you will perceive that the gas I sell does cost me 7s. per 1000." Therefore he supplies at a loss the greater portion of the gas he makes.

Mr. Hill then proceeded to argue that, although the evidence on the Croydon committee stated that the gas did cost 7s. per 1000, yet that the true average price was only 4s. 6d.

Mr. Talbot interrupted him, and said that the pamphlet stated the cost price at Croydon to be 2s. 6d. That was a garbling of evidence, and was one of the calumnies complained of by the City gas companies.

Mr. Hill said in that case he must examine the witness more fully upon the point, and was about to interrogate Mr. Ficklin on his knowledge of the cost of gas at Liverpool, when

Mr. Talbot objected; and contended that Mr. Hill could only refer to Croydon.

The point was argued at some length by the learned counsel on each side.

The room was cleared, and, on the parties being readmitted, the Chairman stated that the committee had come to the resolution:—"*That the learned counsel in re-examining the witness be requested to confine himself to the case of Croydon.*"

Mr. Hill then proceeded to re-examine the witness, when he was interrupted by the Chairman, who said they had just been informed the Speaker was at prayers. Addressing Mr. Hill, he said, without prejudging the question, they might say there was evidently a great desire for cheap gas in the city of London, and that that part of the question might be taken for granted.

MARCH 26.—TENTH DAY.

Some conversation took place respecting the intimation of the Chairman that the existence of a desire for cheap gas on the part of the citizens of London might be taken for granted, and that there was no necessity to examine witnesses on that point. Mr. Hill wished counsel on the other side to sign a paper admitting that fact, and in these words, "That it is admitted that there is a general desire among the consumers of gas in the city of London for a cheaper supply of gas, and that a general belief exists that gas ought to be supplied at 4s. per 1000 cubic feet." This proposal was declined by Mr. Talbot, and the case proceeded, on the understanding that Mr. Hill should exercise his own discretion on that point.

Sir James Duke, lord mayor of the city of London and alderman of the ward of Farringdon Without, was then called, and stated that he had called a meeting of his ward, in pursuance of a requisition signed by a large number of the most respectable and influential inhabitants of the ward, for the purpose of considering the question of a cheap supply of gas. That was in the early part of this year. The meeting was largely attended, and a very strong feeling on behalf of cheap gas was expressed by the speakers, and a petition was ultimately adopted for presentation to the Common Council, urging it to interfere for the purpose of obtaining a cheaper supply of gas. That petition was referred by the Court of Common Council to the commissioners of sewers. All that meeting wanted was cheap gas, and he believed if the existing companies had met the wishes of the consumers by lowering their prices this bill would never have been brought before Parliament. Was not a shareholder in this company or any gas company. The traffic of his ward was enormous, and anything tending to increase the difficulty of transit which already existed would be very injurious to the citizens. The Court of Sewers was elected from the Common Council, and it had the management of the consolidated rate, which included the paving and lighting rates. The Mansion-house is lighted with gas, which was supplied by the City Company. Was not aware of any cause of complaint of the illuminating power or quality of the gas burnt there; for his part, he was perfectly satisfied in these respects. If the powers proposed to be given to the company for opening the streets for the purpose of laying down pipes should cause more inconvenience than the resulting benefits would counterbalance, the Court of Sewers would have to consider the question. The commissioners were composed of tradesmen having shops in the City, and they were directly interested in the question of any increase of traffic.

Mr. Ficklin was recalled, and examined as to the statement concerning the cost of gas at Croydon.—Mr. Hill read the answers of Mr. Cox, stating the various items of cost and receipt as given yesterday, and asked if those were the data on which Mr. Ficklin had authorized the issue of the statement that the prime cost of gas at Croydon was 2s. 6d., including all expenses, except interest of capital; in answer to which Mr. Ficklin said they were, and that he had yet to learn that there was any discrepancy between that statement and the abstract from which it had been drawn up.

Mr. Harrison, deputy alderman of Cornhill ward and a commissioner of sewers, was then called, and confirmed the evidence of previous witnesses, that there was a strong feeling among the inhabitants of the City in favour of cheaper gas. He also gave evidence similar to that given by Mr. Hall and others as to the proceedings of the commissioners of sewers with respect to the proposed plan of the corporation becoming gas manufacturers, the lodging of a bill in Parliament for that purpose, and its subsequent abandonment. He further stated that a company did not require necessarily an act of Parliament to enable them to lay down mains in the City, as the consent of the Court of Sewers would be sufficient for that purpose. The Court of Sewers was charged with regulating the price at which the public lights in the City should be supplied; but their control (he said) was merely nominal, for there was only one company in one district, and they were compelled to accept the terms of that company for that district. He also recapitulated the evidence of former witnesses as to negotiations having been entered into with the companies for a reduction of the price to the private consumers, and the postponement of a final answer from the companies to a day in April next. He considered the price paid for the public lights was a remunerative price, and that was also the opinion of the Court of Sewers generally. Before inquiring into the question of the cost of gas production the commissioners had thought otherwise, and therefore they had not pressed so much on the companies for a reduction of the charge to the private consumers as they were now inclined to do.

Mr. Wm. Stevens, deputy of Bishopsgate Without, was the next witness called. His evidence was almost similar to that of former witnesses as to the agitation in favour of cheap gas; the opinion entertained by the citizens that the prices at present charged were too high; the desirableness of having a third party as inspector of meters as between the company and the consumers; and the existence of complaints with regard to the faulty registration of meters and the deficient illuminating power of the gas supplied up to the period when the stir in the City on the subject of cheap gas began.

Mr. S. Lowe, hatter, of Fleet-street, gave similar evidence.

Charles Pearson, Esq., M.P., was then called, and examined by Mr. P. Taylor.—Is city solicitor of London, and M.P. for Lambeth. Has been city solicitor nine years and a half. Previously represented the ward of Bishopsgate Without in the Court of Common Council. That ward is a very large ward, extending from Lombard-street to Norton Folgate. There was considerable agitation in the city of London some years ago on the subject of cheap gas, and as representative of the ward felt it his duty to direct his attention to the subject. Made an investigation into the cost of production and distribution of gas, and was led to the conclusion that the cost of distribution is the principal element in the expense; and concluded that, as that must be dependent on the distance to which the gas was to be supplied, the inhabitants of London ought to have it at a less price than where the consumption extended over a large area. Having conferred with persons competent to assist him, he arrived at that conclusion and promulgated it in the city of London; and whenever he had an opportunity he enforced his opinion to the utmost of his ability, and with all the energy and zeal he could command, believing as a citizen that, as they paid high rents, rates, and taxes in consequence of their confined locality, they ought to have some compensation in the shape of a lower price of gas. He thought that in no part of the world was there so large a consumption with so limited an area. The area of the City is less than a square mile, being only 620 acres, and there is no other mile with such a consumption. He first promulgated his opinion in the ward, and, it being received with favour there, he was delegated to enforce it in the body in which he was a representative. Since he has been city solicitor he had, neither directly nor indirectly, interfered in the matter until called on to make a report to the commissioners of sewers on the subject of gas. Considered it also part of his duty to abstain from taking shares in public companies. During all the railway mania, when public men were invited to become directors, he carefully abstained from taking any part, and his name was to be found in no such list. His conviction was strengthened after he became city solicitor that his opinion as to gas was sound, and he had since seen it adopted by the Legislature. He alluded to the Worcester Gas Bill, where the principle was acted on that, where there was a large consumption in a small area, the price should be less than where there was a smaller consumption for a larger area. In the Worcester Bill there was a graduated scale, by which when the consumption was fifty millions the maximum price was fixed at 4s., and a proportionate increase of 6d. for every decrease of five millions. The consumption in the city of London is five hundred millions. Derives that amount partly from comparing the quantity of coal purchased with the knowledge of what that quantity ought to render, and partly from information supplied by officers employed in the different gas companies. Is fortified in that conclusion, inasmuch as it was contained in his report to the commissioners of sewers, which was extensively circulated, and has been commented, on and some of the statements in it questioned by a gentleman who has the confidence of the gas companies, and who could have corrected him if he were wrong. Means Mr. Barlow. That gentleman had taken the liberty of correcting him, and questioned his accuracy on other points. He quoted that statement, however, with regard to the consumption being five hundred millions, and he (Mr. Pearson) supposed it was correct, or otherwise it would have been corrected by that gentleman, who was quite competent to do so. Had not looked at the subject precisely in a comparative view as between the relative area and of consumption of the City and those of other places. Was looking at a very good mile (pointing to map), the Strand and neighbourhood, but did not think the consumption was anything like that of the City. Had no hesitation in saying that the almost universal opinion of the citizens of London was that they could obtain gas at a price at least 30 per cent. less than they now paid, and that that price would still be a remunerating one to the maker, giving a profit of 10 per cent. In that opinion he entirely participated, but he did not participate in two other opinions, namely, that the gas now supplied was impure in quality and inferior in illuminating power, and that the meters were defective and did not register accurately the quantity consumed. That there were errors he had no doubt, but he was quite satisfied there was no intentional malfeasance; and he could only account for that opinion that, where there is a monopoly, people always suspected the worst of those enjoying it. Did not think a new company the best remedy for their real or supposed evils. It is the only plan now, but he was averse to it. He thought the best plan was to separate the trade of gas-making from that of gas-distribution. The distribution would be better vested in the hands of those bodies having the control of the paving and sewerage. They should lay down pipes and contract to receive supplies of gas from companies having mains in the vicinity of the City, so that thus the citizens would have all the benefits of monopoly, by having only one set of mains for supplying them, and all the advantages of free trade, by being able to buy in the cheapest and best market. That was the plan he proposed to the commissioners of sewers in his report. They were satisfied with it, and he believed a bill was prepared to carry out that plan. Some time afterwards, however, he was invited to attend their meeting, when he found that, instead of a bill to enable them to lay down pipes, and leave it to others to manufacture and supply the City with gas, it was, in fact, a bill enabling the corporation to borrow half a million of money on the rates for the purpose of enabling them to turn gas-manufacturers. He told them that that was a principle that would never be sanctioned by Parliament, and he left the room, leaving it to their proper officers, Mr. Tyrrell, &c., to advise them as they thought best. Ultimately his objection to that part of the plan relating to manufacture led to the abandonment of the bill. It was part of his plan that the collectors of the commissioners of sewers, who collected the paving and lighting dues, should also collect the

rents for gas, as they would have to call upon pretty nearly the same persons, and thus there would be a considerable saving in that item. Two or three years ago he accidentally became acquainted with Mr. Croll. He entered a room where they were talking about gas, when a gentleman exclaimed, "Here is a person who can tell you something about gas." He was then introduced to Mr. Croll, and soon found he knew more about gas that he (Mr. Pearson) did, and he, therefore, became a listener instead of a talker. Mr. Croll told him he had a project in contemplation for supplying the City with gas, and talked about the corporation having pipes, when he challenged him with having taken his invention, and insisted on Mr. Croll accompanying him to his office to see a printed statement he had issued some years before; and, finding their opinions agreed, they became acquainted. He advised Mr. Croll to bide his time. There was a periodical agitation in the City with respect to gas, and he advised him to wait until he could get his boat out with the current. He encouraged him in the meantime to get rid of his country engagements and try here, as this was a large place requiring an enterprising man. That was about two or three years ago. At that time speculations were not in favour with the public, who were just then getting out of the railway mania. He saw but little of Mr. Croll from that time until the present agitation began and ward meetings were being held. He then sent for Mr. Croll, and announced to the commissioners of sewers that if they adopted his views a man was ready to contract with them for the manufacture and supply of gas. He did not mention his name, nor did it appear in his report. Mr. Croll is a partner in an extensive gas-meter manufactory, and the gas companies are the customers of the meter-makers, and he did not like to peril his custom with the gas-meter buyers until he was sure his scheme would be adopted, and he therefore concealed Mr. Croll's name. He said gas could be supplied to the corporation at 2s. 6d., so as to enable them to sell it at 4s. When he said 2s. 6d. he did not mean the gross price, but the net price, that is, at the burner, not at the gasholder; he meant after it had been supplied and had passed through the meter; deduction also having been made for leakage. That is, the quantity of gas as returned by the rental would be less than 2s. 6d. That figure was more than Mr. Croll gave him, but he always liked to understate things in such matters. The contractor could only be paid for the gas actually registered, and would have to sustain all loss incurred through leakage. Mr. Croll might yet be in a position in which he might be required to tender for supplying gas, and he did not think it fair, therefore, to disclose the minimum price which he mentioned. Some of the gentlemen present might be his opponents. He now came to the time when this new company was started. He was sure the corporation bill would be abandoned, and, as he was determined the citizens should not be disappointed in their wish for a fair inquiry, he advised Mr. Croll, as soon as he left the room, to start a private bill, and to go on with it as long as the commissioners' bill went on, using the expression that he would stand behind the wicket and catch the ball if they missed it; that is, that if they succeeded in getting their bill he would be an auxiliary to them, which if they failed, his bill would serve as a substitute. The skeleton of a company was formed, Mr. Croll being the promoter, and two or three gentlemen consenting to act with him in the matter. He (Mr. Pearson) did not do so, because, as long as the commissioners of sewers went on with their bill, he thought it would be improper in him to interfere in the private details of the company. The commissioners' bill was withdrawn to the great dissatisfaction of the citizens, who at a public meeting expressed doubts, in fact, as to the sincerity of the intentions of the commissioners in bringing in the bill, as it was introduced shortly before St. Thomas's-day and withdrawn shortly after. He believed that the concurrence of dates was only a coincidence, nothing more. Still it was a serious injury to the character of the corporation that such a feeling should be entertained, and as an officer of the corporation he felt it his duty to do something to destroy that impression by supporting this bill. He did so principally with his pen, by writing a true statement of the facts as they occurred, that everything should be public. He was the author of most of the papers published. Had no pecuniary interest in the bill beyond having taken fifty shares. His family and friends were all large shareholders, and he felt a strong interest in giving effect to what he believed were the wishes of the citizens of London. He ate their bread, and was anxious to promote their interests. Had the company not been formed he would have borne one-third of Mr. Croll's expenses. At the commencement he had given that gentlemen £100, which he hesitated to accept; but he had given him that sum with the view that if the old companies should reduce their prices he would not sanction the continuance of the bill. Had been engaged in the preparation of a petition on the subject, as, before taking any concern in the business, he had insisted on the citizens of London being canvassed, and that no one should be applied to for his signature until he had had a printed copy of the petition in his possession forty-eight hours before. The result was that petition (producing petition) with 4900 signatures attached to it. Mr. Pearson then read the prayer of the petition, which was in favour of the proposed new company. The amount of gas rental paid by the persons signing that petition had been returned at £86,000 a year. The names of firms were appended in their collective capacity, the partners not signing individually. The signatures contained many of the most respectable firms in the city of London.

Mr. Hill: This naturally leads to the petition of the 134 bankers and merchants?—I would rather say nothing about that.

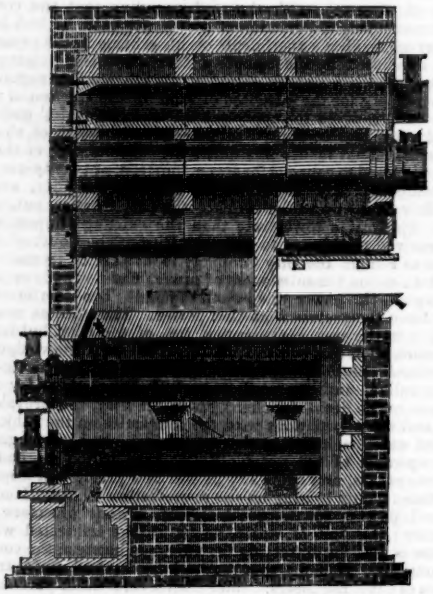
MARCH 27.—ELEVENTH DAY.

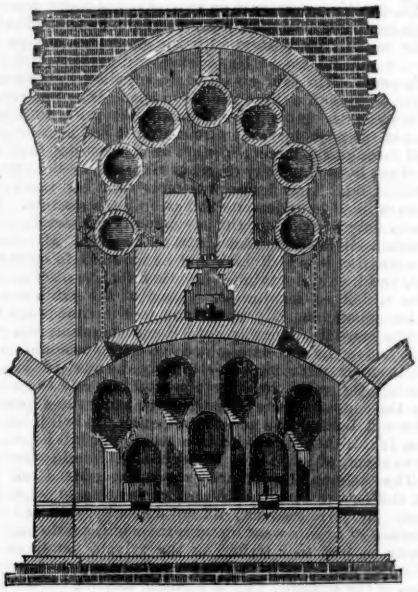
Mr. Charles Pearson was recalled, and cross-examined at great length by Mr. Talbot.—His evidence was chiefly confirmatory of that given by him yesterday. He stated that he was not much acquainted with the local circumstances of Worcester, but he considered the Legislature in passing the Worcester Gas Bill had recognised the principle that the price of gas was dependent on the relation of consumption to area. In that bill the graduated scale began at thirty million cubic feet consumption per annum, at which the maximum price was fixed at 5s. 6d.; 5s. for thirty-six millions, 4s. 6d. for forty-two millions, and 4s. for forty-eight millions, which was considered the highest probable consumption. Mr. Pearson was then examined as to the circumstances under which he had been called on to report to the commissioners of sewers on the subject of gas, which we stated was in consequence of Deputy Peacock, the chief commissioner, being aware of his knowledge of gas matters. He repeated, that if the old companies had acceded to the wishes of the consumers the present bill would never have come before Parliament. He was then examined as to a pamphlet issued by him on the subject of cheap gas, entitled "A Dialogue between Charles Pearson, Esq., M.P., and a Gas Consumer of the City," and stated that the object of it was to explain the cause of the present agitation, and show the remedy for the evil complained of. He was then interrogated at great length as to his connection with Mr. Croll, and repeated most of the statements he made yesterday. With regard to the Tottenham works, he said he had taken fifty shares in that concern. The capital was £15,000, the gas rental £1700, the length of mains thirteen miles, and the price charged to private consumers 7s. per 1000. Six per cent. profit had been divided the first year, this year 9 per cent. would be realized. With regard to Mr. Bovill, that gentleman had taken a very large number of shares in the Central Gas Consumers' Company, and was allowed a seat at the board of directors, with the understanding that the company would not commence the erection of any works until he had had an opportunity of making experiments on his scheme in the presence of engineers appointed by the company. So convinced, however, was the company of the visionary nature of his scheme that negotiations were then pending for the purchase of land for the erection of works. Mr. Croll had tendered to supply gas into the companies' gasholders at 1s. 4½d., and had consented to take £50,000 worth of shares in part payment. That tender was under the consideration of the company. He proposed to contract for seven, fourteen, or twenty-one years. Former companies had attempted to get into the City, and had brought their mains up to the verge of the City frontier, but, as they could not supply at a lower rate than the existing companies, they had not received permission to enter the City. The Court of Sewers had power to compel the City Company to dispose of its mains, &c., to them, but, as the commissioners of sewers had no funds applicable to that purpose, the power was practically null. The Chartered Company had freed themselves from that power. The witness was then examined as to the area, consumption, &c., of the City, but he could give no information of a practical nature of his own knowledge.

Mr. Nathaniel Machin, wholesale confectioner, Bishopsgate-street, was then called, and repeated what had been stated by former witnesses as to the desire for cheap gas in the City, the prevalence of agitation and the negotiations with the companies on the subject.

Mr. Croll was then called, and stated that he had been a gas engineer for upwards of ten years. Before that period he had made experiments on gas, and could say he was now pretty well acquainted with all those points bearing on the manufacture of gas. Had taken out several patents for improvements in various processes of gas manufacture; the first of which was a patent connected with the purification of gas, for extracting the ammonia between the condenser and the purifier. Had for that received the Telford medal from the Institution of Civil Engineers. Since then several other patents on the same subject had been taken out by other parties, but his invention led the way. His was the first successful process invented for the purpose, and still holds its ground. Had also taken out a patent for a dry gas meter. That had been out for four or five years, during which time it had had a large sale. His patent had been infringed by an extensive meter-maker, and he had been compelled to bring an action. Had sold upwards of 14,000 of his meters. Since the agitation in the City on the subject of cheap gas had commenced, and he had been put prominently forward as the promoter of the movement, the sale had been very much diminished, although, fortunately, they had received large orders from abroad, which made up the loss they otherwise should have sustained. Many of the gas companies had ceased to purchase their meters. Another of his patents was for setting up a combination of clay and iron retorts. (Mr. Croll here produced a drawing.) The principal feature of that invention was, that unequal intensities of heat were made available in the same process. There were two arches, one above and one below. These (pointing to the drawing) are the clay retorts in the arch above, these are the iron retorts in the arch beneath. The heat when at the highest intensity acts on the nonconducting material, clay, after which it descends to the arch beneath, and acts on the more permeable material, iron. It then passes to the main flue, which is at the base of the iron retorts. By this plan he got increased duration of retorts and a saving of fuel. The clay was above the iron. Clay was used in Scotland, but not in combination with iron; consequently, there was a larger consumption of fuel, as clay required a greater quantity of heat than iron, owing to its not being a conducting medium; that is, more heat was required to extract the same quantity of gas with clay retorts than with iron. In London iron retorts were chiefly used. Some heat was wasted with iron retorts, and by using a combination of clay and iron he obtained a diminished consumption of fuel with a longer duration of material. (Pointing to drawing—see next page.) This is a setting similar to what is used in London; these are iron retorts; but for the purpose of protecting them from the direct action of the heat they are covered with this brickwork; the heat passes up here, and then passes off at the top, the flue being at the top. In this other case the heat rises over the retort and descends through the arch beneath, where it heats the iron retorts, and, lastly, passes into the main flue, which is beneath. In consequence of the oxide of iron formed on iron retorts, the protecting brickwork is fluxed away, and the iron retort is thus exposed to the

direct action of the heat, so that the average duration of iron retorts is only ten months instead of two years, which he got by his process. The heat being variable in different parts of the bench, being more intense above than beneath, if clay were used throughout the heat in the lower arch would not be sufficient to obtain the same quantity that was obtained in the upper one; if iron were used throughout, then he would have more than enough in the upper, supposing there was the proper amount in the lower arch, and the retorts in the upper arch would have to be protected by firebricks, but the retorts would soon become fluxed, from the oxide formed by the iron retorts combining with silica. By his plan the necessity of protecting the retorts was done away with, and the retorts were merely set in. By his plan the iron retorts did not wear out so quickly. Clay retorts were cheaper than iron retorts, and lasted longer. He commenced making gas at the Tottenham works in August, 1846. The same two settings had been employed ever since; there had been one iron and two clay retorts destroyed out of the whole number, and the remainder would now work twelve months, both iron and clay. He would not predicate the same of other benches where that plan was not in use. His plan effected a great saving in the wear and tear of retorts. By economizing the heat he effected a great saving of fuel and labour, and the setting occupied less space in the retort-house. During the winter of 1847 he had two settings of that description, and they were enough to supply the whole of Coventry during the longest nights in that winter. Before he took





possession of the works they were not large enough, so much so that a portion of the setting was outside of the retort-house. At that time the rental was £3400 a year, and at the time he gave up the lease he could have produced double the quantity of gas, while the rental had increased to £5200 a year; the lowest price when he took it being 9s., while when he left the highest price was 6s. 6d., and the lowest 4s. 6d., per 1000 feet. His system had also been adopted at Winchester, Gosport, and by the London Independent Company, and previous to this inquiry they were about to erect a larger number on this plan. He had constructed works at Leyden, in Holland, on the same plan. Mr. Barlow had alluded to his plan in his pamphlet when he says, "Some attempt will doubtless be made to invalidate my estimate of the cost of gas, and principally on the ground that the projectors have an improved system of furnaces, &c.; by which means the cost of gas would be reduced by about 2½d. per thousand." In making his calculations with regard to this matter he had taken the fuel at 20 per cent.; that is, for every 100 tons of coal he should have 80 chaldrons of coke, a ton of coal producing a chaldron of coke, the difference being employed in heating the retorts, he taking 20 chaldrons of coke to 100 tons of coal, which he could do on the old system. Had been superintendent of the Chartered Company's works before he went to the Tottenham works, and, from his connection with those two works, his attention had been directed to the area of the city of London. Had not measured it himself, but, from the statements he had seen, he believed it to be less than a square mile; it was about 620 acres, 640 acres being a square mile. Speaking generally, he thought the area of the metropolis, exclusive of the City, was about 65 square miles. Mr. Pearson had estimated the consumption in the City at five hundred millions; should say it was fully that. Mr. Barlow had given the consumption of the metropolis at three thousand two hundred millions; had been in the habit of considering the matter, and should say it was certainly not less.

By the CHAIRMAN: That included the City.

The number of public lights in the City was 2678, namely, 2087 batswing burners, consuming each 5 feet an hour, or 20,000 a year; and 591 cockspur burners, consuming each 4 feet an hour, or 16,000 a year. The total consumption of the public lights was 51,196,000 feet a year, leaving the consumption by private lights 468,804,000 feet. The proportion was thus about as 9 to 1. The price charged for the public lights in the City was £4. 4s. a year for batswing burners, and £2. 14s. for cockspur burners. Taking the two together, the price was about 4s. 0½d. per 1000. From that the cost of lighting, cleansing, and repairs must be deducted. That was 15s. per lamp a year. So that the net receipts for the public lights was about 3s. 3¾d. The charge for private consumption was 6s. Taking the nine-tenths at 6s., and the one-tenth at 3s. 3¾d., the average price of gas in the City would be 5s. 8¾d. or ¼d. Mr. Barlow, in speaking of the mode in which the three thousand two hundred millions is consumed in the metropolis, states that the gross charge to the private consumer is 6s., and to the public lights 3s. 10d., and that the average price is 4s. 11d.; that made the consumption of the public lights equal to that of the private consumers; it must be so from the figures.

MR. TALBOT here stated that a second edition of that pamphlet had been issued, and handed a copy to the counsel on the other side.

Examination continued.—Should have thought the private consumption was greater than Mr. Barlow made it out. Had estimated the average price in the City at 5s. 8¾d.; thought that a very high price for an average. His reason for that conclusion was that works could be erected for the supply of three hundred and six million at a cost of £164,808, while mains were provided for double that quantity, and the gas produced into the gasholder ready for distribution at 1s. 4½d. Looking at the relative proportion between the public and private lights and the small quantity of mains required for supplying the private consumers, requiring less outlay and involving less leakage, he did think 5s. 8¾d. a large average. Had expressed that opinion freely to many persons, and, among others, to Mr. Pearson, whom he casually met. Finding the opinions of the citizens of London coincide with his own on that point, he had been induced to undertake to start this company. Was, in the first instance, the sole promoter, and was now registered as such. Was personally responsible for the expenses of starting it, and had hitherto discharged all the expenses out of his own pocket, and if the company were not formed would have to bear the loss. Had parted with other valuable property for the purpose of enabling him to take up this speculation. Had signed the subscription contract of this company to a large amount, and, in fact, had backed his opinion with his whole fortune. With regard to the details of the company, the proposed capital was £250,000, with power to borrow £83,000 on mortgage. Of this they only proposed to raise at first £164,000, the estimated capital necessary for producing three hundred and six million feet a year, to which they should at first limit their production. His reason for supposing that, in the outset, they should have a demand of three hundred and six millions was that he believed the reduction of price they proposed would greatly increase the demand, and he expected also to have a fair proportion of the existing consumption. One ground for that expectation was the fact of so large a number of consumers being actually partners in the concern. The petition signed by 4900 consumers in favour of the company had also confirmed that expectation. They proposed to spend their capital thus:—Purchase of ground, £20,000; manufacturing plant and apparatus, £26,855; gasholders, £15,000; mains, services, and meters, £72,516; total, £134,371. To that he added 10 per cent. for contingencies, equal to £13,437; preliminary expenses, £8000; and floating capital, £9000; making a total of £164,808. For the second total of capital for manufacturing seven hundred and thirty-six millions, he doubled all the items except that of mains, which, as he proposed to lay down at first enough to supply the whole amount, would require no further outlay, except for meters. In that item, therefore, the only addition would be £7500 for meters. A capital of £165,000 would enable them to manufacture three hundred and sixty-eight millions, and an additional capital of £85,000 would enable them to double their manufacture. Had every reason to believe that in time they should be called on to furnish that additional quantity. The consumption of gas in the City had by no

means reached its maximum. If the price of gas were lowered to 4s., it would come within the compass of a great number of mechanics who could not buy it at 6s.; besides which, it would come into extensive use for domestic purposes, such as cooking and heating apartments, to which it was not now applied in London. He proposed that the illuminating power of the gas to be supplied should be, from a consumption of 5 feet an hour in one burner, not less than the quantity of light given by 12 spermaceti candles, consuming 2 grains per minute, or 120 grains an hour. For that purpose he should use an argand burner with 15 holes, with a 7-inch chimney, and that should be equal to 12 spermaceti candles burning 120 grains an hour. He believed ground could be purchased within 2 miles of the City at a much less price than he had put down, namely, £20,000. With regard to cost of manufacturing apparatus, he put down £12,527 for building. He allowed stowage for 10,000 tons of coals, about 2 months of winter consumption. So large an amount of stowage would be a material item in calculating the cost of gas. For retorts he put down £6686; that was for 504 retorts, or 252 clay retorts of circular form, 15 inches in diameter and 8 feet 6 inches long, and 252 iron retorts of D shape, 12½ inches each way, and 8 feet 6 inches long. They would each manufacture 4000 feet in the 24 hours, being a total of two millions sixteen thousand feet a day. The consumption of the longest night would be about one million eight hundred thousand feet, so that they would have an ample margin in case of accident. For condensers he put down £1237. He reckoned the iron for these at £9 a ton, and for the other cast-iron works at £10 a ton. Messrs. Fox and Henderson had furnished an estimate for the ironwork at £10 a ton, but, as the condensers were plain piping, he had taken them at £9 a ton; therefore he put down for the 2 condensers £1237. The purifiers, at £10 a ton, he put down at £1117; in that he included two separating vessels to be used in extracting the ammonia by the use of chloride of manganese. That was the patent to which he first drew the attention of the committee. Ammonia had the effect of diminishing the illuminating power of the gas, and also corroded and destroyed the meters and fittings through which it was transmitted, acting more especially on brasswork, forming an ammonurate of copper, which gave a blue tinge to water, and was always found in water meters after gas had passed through any considerable time. It also rendered the use of gas in private houses disagreeable. The sulphuret of carbon combined with the manganese, and prevented that close, choking effect which was complained of in rooms where gas was burned, unless purified by a metallic salt. That was what was complained of some time ago at the Athenæum Club, when a great number of books were damaged. Besides the greater illuminating power, and the rendering the gas more suitable for domestic use, he also got a valuable product, namely, muriate of ammonia, which had a marketable value, being what smelling salts was made of. It was *sal ammoniac* in an impure state. He had not, however, calculated on any gain from that in these estimates, as he was to supply the material of purification, and have the products as compensation for the use of his patent. By using chloride of manganese he saved one-half or one-third of the lime otherwise required for purification. He proposed to use wet lime, as in that state a much less quantity was required to purify a given quantity of gas than if used in a dry state. He also proposed to use an exhauster, to remove the pressure of gas between the condensers and the purifiers. The exhausters were so arranged as to pump the gas or remove the pressure and force it forward through the purifiers. There was the same pressure on the purifiers; it was merely removed from the retorts. The exhauster was so worked that the pressure-gauge always remained at zero. For general connections he had put down £561; for station-meter, governor, and pressure-register, £1250; for steam-engine and exhauster, £1150; for valves, £290; for tools, smiths and carpenters' workshops, £1034; for superintendence and plans, £1000. That was independent of the preliminary expenses. He proposed to have three telescope gasholders, each to hold 412,000 feet, or a total of one million two hundred and thirty-six thousand feet.

MARCH 28.—TWELFTH DAY.

Mr. Talbot applied for leave to examine the plans produced yesterday by Mr. Croll.

Mr. P. Taylor said there would be no objection to the other side having an opportunity of inspecting the plans.

Mr. Croll was then recalled. His estimated mileage of mains was 52 miles 7 furlongs. The largest diameter of main was 24 inches, and from that graduated down to 2 inches. He had a large number at that size, nearly 36,000 yards. He put the average cost of the whole at £6 a ton down to 7 inches inclusive; and £6. 10s. a ton from that to 2 inches; the casting being more expensive as the diameter became smaller. The whole cost of pipeage was £34,790. For laying down pipes he put £12,995, making a total of £47,785. He did not include cost of paving and repaving in that sum; he put those expenses at 1s. 6d. a yard; making £6981 additional. After the mains were first laid down the trenches sank, and required additional work; that was called "repaving." Had received tenders for laying down mains, and had been told by several acquainted with that work that laying down mains by night would make no material difference in the expense. Men would probably prefer working by night in summer rather than by day, as it was much cooler. For syphons, branches, and bends, he put down £5000, estimating at £10 a ton. There were 42,000 yards of service-pipes and 2-inch mains, at 2s. 6d. a yard, in addition to the 52 miles; that would be £5250. Meters he averaged at £2. 10s. each; this he took at £15,000 for the larger production; for the smaller production the sum would, of course, be one-half. There would be no difference in the charge for mains between the larger and smaller productions, as he proposed to lay down the whole amount of mains at once. The total expense for mains for the lesser production would be £65,016; and, adding 10 per cent. for contingencies, that would make £71,500. The general proportion of the outlay for mains to the whole outlay for works was from one-half to two-thirds. Taking, for instance, the London, Vauxhall Company, which had several hundred miles of mains, or, indeed, any of the companies outside the City, which all had a very large quantity of mains, there was not one of them whose outlay for mains was less than two-thirds of the whole. The Chartered Company had a large number of mains, and the value of them must far exceed the other costs of manufacture. The £71,000 he had put down under that head was less than one-half of the capital to be raised; it was between one-half and one-third. When they reached the manufacture of seven hundred and thirty-six millions the proportion would be still less; that was a material ingredient in estimating the price of gas. Had received tenders for laying mains in the City, and the prices he had stated were taken from those tenders. They were for laying pipes, including material and labour of all kinds (except making good the paving), and repairs of gas, water, and service pipes. The gentleman from whom he had received that tender was well acquainted with the subject and competent to do the works. He was Mr. John Aird, of the Phœnix Gasworks, Greenwich. He was unwilling to come forward, however, unless compelled to do so by an order of the House. Had also received tenders for mains at £5. 17s. 6d., and £6 for the two classes severally. Paving he had put down as a separate item, at 1s. 6d. per yard. For leakage he allowed 16¼ per cent., or one-sixth of the whole. The cost per 1000 would be 8d. It would be the same on seven hundred and thirty-six millions, so that his net production would only be six hundred and thirteen millions. Sixteen and a half per cent. was a very large estimate, owing to the short length of main proposed, giving a less surface. The proportion would be the same on 300 miles of main. At Nottingham the leakage was put at only 11 per cent. Without calculating the exact proportion between leakage and stealage, he considered the loss by surreptitious burning was greater than by leakage. Surreptitious burning is carried on to a very great extent in London. It was occasioned, to a great extent, by the opportunities for fraud afforded by the use of wet meters. The bottom of the measuring-chamber in wet meters was water, and, consequently, the size of the chamber varied with the water-line, which itself varied as the water was carried off by evaporation or otherwise. That being so, it was necessary occasionally to add water, for which purpose there was a hole in the meter stopped by a plug. By that means the consumer was enabled to add water when required, but he could also take out water. Then there was a float to keep the valve open for the passage of the gas, and if a very large quantity of water were taken out the float would sink and close the valve, thus preventing the passage of the gas, but, by tilting the meter on one side, so that the water kept level where the float was, the chamber would still be increased, and the float would still keep the valve open and the gas would pass through without being registered at all, so that the consumer would have his gas for nothing. If he did not wish to defraud to so great an extent, he would be able to cause the meter to register less by taking water out. Another inconvenience attendant on the use of wet meters was that they must be placed in the basement story, in order that the water carried off by the gas might be able to drop back into the meter as it condensed, or else the gas would be caused to "jump" by its free passage through the fittings being obstructed by the water. Therefore it was essential the water meter should be placed in the lower part of the house. It was necessary that it should not be put in the area, or anywhere where it was exposed to the weather, as the water might freeze. It was most frequently put in the cellar, or a place where the temperature was most uniform. There thus arose this inconvenience, that, the cellar being usually locked up, the inspector on going his rounds at other than his usual periodical times had not the opportunity of immediately seeing the meter and seeing that it was all right. That was taken advantage of by consumers to defraud the company. Remembered an instance while he was engaged in the Chartered Gas Company's works where it was suspected that a very large consumer was defrauding the company, but the company's inspector had never had an opportunity of inspecting the meter except at the usual time, admission to the cellar where it was kept being denied him on various pretences. At last, after much difficulty, he succeeded in effecting an entrance, when he found that the meter had been wholly removed, the service-pipe being connected with the fittings by means of a bladder having a hole at each end. Was told that that had been carried on for many years before it was discovered. The dry meter could be used in any part of the house and in any situation either above or beneath the fittings, there being no water to evaporate. The dry meter could also be placed in an open situation where it could always be directly visible. Of course it would be the fault of the company if the meters were not so placed that the inspector could see them whenever he called without being put off by any excuses. The dry meter could not be tampered with without leaving evidence behind it. With regard to the rental to be derived from the seven hundred and thirty-six millions, at 4s. per 1000, it would be upwards of £120,000. The quantity proposed to be supplied at first was three hundred and six millions six hundred and sixty-six thousand six hundred and sixty-seven feet, which, at 4s. per 1000, would yield a rental of £61,333. 4s.; 4s. was the maximum price for private consumers, but the public lights, including cleaning, lighting, and repairs, would be about 4s. 0½d. The expense of cleaning, lighting, and repairs would be 15s. a year each lamp. The witness was then examined as to the production account. The net cost he gave at £25,576 for the three hundred and six millions, and double that for the larger quantity. He had tendered to supply gas as far as regarded production alone at 1s. 4·67d. for either the larger or smaller quantity. He arrived at that 1s. 4·67d. in this manner: the coals he calculated at 16s. delivered at the works; 1 ton of coals he estimated would yield 9200 feet; that gave him a gross sum for coals of £32,000; that was for 40,000 tons; that was 1s. 8·87d. per 1000; labour he put down at 3½d. per 1000, or £5366 for the whole; wear and tear of retorts £3066, or 2d. per 1000;

lime £383, or ¼d. per 1000; wear and tear of works and mains £3066, or 2d. per 1000; that made a total of £43,883, or 2s. 4·62d. per 1000. The price put down for coal was a high price; in 1846, however, some companies had paid 16s. 2d. a ton. Had no doubt he could now get tenders for coals at 16s. Gas coals had been selling during the last 2 or 3 weeks at 12s. Had put the production of gas per ton at 9200 feet. Mr. Barlow, he said, mentioned 9250 feet in his pamphlet as the product of a ton of coals. The average was even more than that, but the greater the production the weaker the gas. With regard to the sum for wear and tear of retorts, if his system of retorts were adopted, the amount could be nothing like that. Had proved that by his experience at Tottenham. The figures given were all for the less quantity, and would have to be doubled for the larger. The credit side next came. 40,000 tons of coal would produce 40,000 chaldrons of coke; the quantity of which for sale would be 32,000 chaldrons; as 20 per cent. of the coke produced would be consumed in the gas works for heating the retorts. Had worked the retorts on the old system with that quantity, but by his system not one-half of that would be required. He allowed 10s. a chaldron for the coke. That was a low price. Had stowage for a very large quantity of coke which would enable them to wait for the market, so that they would not be obliged to sell from day to day, as some of the companies were. Breeze (small coke, sold for brickmaking) he took at 8 per cent., and the price he put at 4s. a chaldron. Allowed 10 gallons of tar for every ton of coal, and put it at 1d. a gallon. Set down nothing for ammoniacal liquor, as it was very small. Adding these together, the total amount was £18,306, which, subtracted from £43,803, left £25,576, or 1s. 4½d., for the gas in the gasholder. Had offered to manufacture gas for the company at that sum; and, if they accepted his tender, he should consider himself amply recompensed for the trouble he had undergone in this matter. With regard to the distribution account, it was as follows:—Lighting and repairing lamps (2678, at 15s.) £2008. 10s.; collection and bad debts (2 per cent. on rental) £1230; rates and taxes (estimated at 2 per cent. on rental, but he was not certain about the item) £1200; law expenses £300; stationery and incidental expenses £1200; directors £2000; engineers, clerks, and inspectors, £3000; maintenance of works (1 per cent. on capital) £1655; wear and tear of meters (10 per cent. on their value) £750. Did not think the bad debts would be numerous. The sum put down for directors was thus disposed of:—There were to be 13 directors. The chairman would receive £300, the deputy-chairman £200, each of the other directors £120, and £160 for the clerk. The item for engineers, &c., was thus apportioned:—Engineer £1000, secretary £700, rent of offices £250; 2 clerks at £150, and 2 at £100; 4 inspectors at £150, 3 at £120, and a messenger at £60. Those officers would be sufficient to work the whole quantity; but he had allowed an addition of £750 for the larger quantity. The items of maintenance of works and wear and tear of meters would have to be doubled for the larger quantity, and also the items of collection, bad debts, and rates and taxes. Law expenses would have to be raised from £300 to £500, and £300 woud have to be added for stationery and incidental expenses. On the smaller quantity the whole sum would be £13,373, and on the larger quantity £18,708. That on the smaller quantity would be 8·71d. per 1000, and on the larger quantity it would be reduced to 6d. and a little more. Practically, the whole cost of production and distribution would be—on the smaller quantity £38,950, and on the larger quantity £69,831; that is, on the smaller quantity 2s. 1·38d., and on the larger quantity 1s. 10·74d., per 1000 cubic feet. For the smaller quantity must be added 10 per cent. dividend on the capital of £165,000, required for manufacturing three hundred and sixty-eight million feet, making the total cost of producing that quantity £55,500, equal to 3s. per 1000; and the cost of production and distribution, including interest on capital, for making seven hundred and thirty-six million feet would be £94,831, making the gross cost per 1000 on the former 3s. 0·17d., and on the latter 2s. 6·89d. Deducting the gross sum for the smaller, namely, £55,500, from the rental, namely, £61,333, they had a balance of £5833 after paying 10 per cent. for profits, and that balance would be sufficient for a reserve fund; and, as the supply increased, would go in reduction of price. When they got a supply of seven hundred and thirty-six millions they would have a surplus of £28,000, which would be amply sufficient for a reserved fund and a reduction of prices. The 4s. he had spoken of as the maximum price was upon the quantity actually consumed at the burners after the leakage. He proposed to have 3 gasholders, each capable of containing 412,000 cubic feet, or a total of one million two hundred and thirty-six thousand feet. The calculated consumption of the longest night was one million eight hundred thousand feet. The capacity of the gasholders would be sufficient for that supply; for as the holders were emptied they were filled again from the retorts. The retorts were sufficient to furnish that consumption, and the stock in the gasholders was so much additional to meet contingencies. The price of each of the gasholders would be £2521, and of the tanks each £2351. He had put the total cost in the estimate at £15,000, so as to leave a margin. Had received tenders for the ironwork required at £10 per ton for the cast-iron work, and £24 per ton for the wrought-iron work.

This was understood to close the examination in chief of Mr. Croll. Some discussion then took place with regard to the cross-examination, Mr. Talbot stating that he could not then proceed with the cross-examination of the witness, inasmuch as he had not had an opportunity of inspecting the plans and drawings he had referred to, and, indeed, had not received copies of the principal plans.

The CHAIRMAN suggested that the cross-examination should be postponed, and that Mr. Hill should proceed with the examination of other witnesses; but Mr. Hill objected that such a course would be inconvenient, as, until after the cross-examination of Mr. Croll, he could not tell what evidence might be further required. Ultimately it was agreed that the proceedings should be adjourned, to give Mr. Talbot time to examine the plans, it being understood that, in order to compensate for the delay, the commissioners would either obtain leave from the Speaker to sit during pleasure on Thursday or to sit on Saturday.

MARCH 29.—THIRTEENTH DAY.

Mr. Croll begged to add that he had submitted his estimates for buildings to an eminent architect, Mr. Stevens, and that gentleman had added £2300 to that estimate, making a total for building of £14,816. That was in consequence of the increased footing for walls and chimneys, considering the ground of which they were likely to become proprietors. He had also lined the chimneys some way up with firebricks, which was hardly necessary. Mr. Stevens considered 10 per cent. ample for contingencies.

Mr. Croll was then cross-examined by MR. HOPE. Had consulted no architect or builder with regard to his plans and estimates until yesterday. A builder had seen his estimates for building, and was willing to contract for erecting the buildings at the prices he had given. The estimates for ironwork had also proceeded entirely from himself. Messrs. Fox and Henderson had tendered to supply the cast-iron work at £10 a ton. Had given plans and specifications for works at Leyden and Tottenham, and had rearranged and altered the whole of the works at Coventry; had also rearranged most of the works at the Chartered Company's works at Brick-lane, and put them to a great extent in the state in which they now were. The works at Leyden had not been erected more than twelve months. They were constructed for a consumption of twenty-five millions, and they cost £20,000. There were 25 miles of main. The population was a poor one; out of a total of 34,000 souls, 17,000 had received relief from the public soup-kitchen. Notwithstanding, the dividend declared the first year was between 6 and 7 per cent., the charge was 5 guilders per 1000, or 8s. 4d. The capital of the Coventry works was £20,000, but the sum expended on the works was considerably more than that. When he first went there they were in a very bad state; for instance, he found the lime-purifiers were made of deal boards instead of cast iron. The consumption at Coventry was twenty millions. At Tottenham the retort-house was capable of holding retorts to make twenty-five million feet; the rental was £1710, and, owing to the great length of mains for the small consumption, the average price was under 5s., so that the consumption was only eight millions. The quantity of coal carbonized there from September, 1847, to March, 1848, was 642 tons. Could not accurately state the present consumption, as the directors had refused him a copy of the balance-sheet. By considering the sums paid for coal last year he estimated the consumption at 1054 tons. The works cost the company £15,468, but then he erected several superfluous buildings, such as stables, coachhouse, greenhouse, and a very excellent house for the manager; also baths and cupboards for the men. The cost to him was not more than one-half of the price at which he sold them to the company. The mains at Tottenham were 12 or 13 miles in length. The comparative cost of the works for the proposed new company was much less than the cost of works at Coventry and Tottenham. It was proposed to increase the Tottenham works for the purpose of supplying Enfield. The data on which he arrived at his estimate of a consumption of three hundred and sixty-eight millions were chiefly based on the fact of so large a number of the citizens of London having signed the petition in favour of the company. The actual consumption of the city of London was from five hundred millions to five hundred and twenty millions. He arrived at that sum partly by facts he did know, and partly by facts he did not know. Very little gas was burned by contract in London. He had not ascertained the whole number of consumers in the city of London, but had been informed it was more than 6,000. He estimated the amount of rental of the Chartered Company for gas supplied from the Brick-lane and Curtain Road works at £60,000, and the City Company rental he estimated at £90,000. Had no data for that except looking at the surface supplied, comparing it with that supplied by the Chartered Company. The gross rental, including that for public lights, he estimated at £150,761, and, deducting £10,361 for the public lamps, the rental for the private lamps would be £140,400. Taking the charge at 6s. per 1000, he thus arrived at a consumption of four hundred and sixty-eight millions. He derived the consumption from the rental. Mr. Croll then repeated what he stated on the previous day with respect to the cost and number of public lights in the City, which he stated had been obtained at Guildhall. Expected to obtain a fair proportion of the existing consumption; and also calculated on receiving the increase which would necessarily follow on a reduction of price to 4s. Expected to obtain the three hundred and sixty-eight millions within eighteen months from the commencement of their works; so that in two years he expected to be in possession of three-fifths of the whole present existing consumption. He meant with the increase he calculated on. He should not be surprised if the present consumption should increase one-fourth as soon as the price was lowered to 4s. In that case, if they only received one-half of the existing consumption, they would get a total supply of three hundred and ninety millions at once. Was aware the existing companies had a large capital employed in their present concerns; and would say, if they lowered their charge also to 4s., they would get another fourth. Mr. Croll was then examined at great length for the purpose of showing that it would bear materially on his calculation of cost of production if he failed in obtaining the demand he had reckoned on, namely, three hundred and six millions and a half. He admitted that it would; but said, if he had only one-half of his calculation, there would still be a large profit. Mr. Hope endeavoured to induce him to point out the items in his estimate of cost of production that would be rendered higher per 1000 cubic feet in proportion as the total quantity manufactured was diminished; and nearly the whole of the remainder of this day's examination was confined to this point. Mr. Croll said a reduction of one-half of the quantity manufactured would be accompanied by an equal reduction in the charges for coal, labour, wear and tear of retorts, and lime; wear and tear

of works and mains would also be reduced, but not to so great an extent; on the other hand, the credit items for coke, tar, &c., would also be reduced.

Mr. Hope: What are your fixed charges?

Mr. Croll: The directors would not be reduced, nor the staff of engineers, secretary, &c. Neither would the 10 per cent. of dividend on capital be reduced. Those items would all have to be doubled per 1000 feet if they only got a consumption of one hundred and fifty-three millions. The charge per 1000 he had put down for dividend was 10·79d., so that, if their consumption was only one-half of the estimate, that item alone would add nearly 11d. to the cost per 1000 of manufacture and distribution. Mr. Croll was then examined at some length on the question of whether the cost of labour would diminish in the same ratio as the quantity manufactured, and Mr. Croll contended that, whether the quantity made was large or small, the cost of labour was always in the same proportion. Mr. Croll said they proposed to lay out the whole of their £165,000 of capital at once; but explained that they should only do so in the certainty of getting the consumption they had stated. They proposed to erect 3 gasholders, and to have 504 retorts; but they should not have such a number if they found it likely that their immediate supply would be less than anticipated. They should, however, still lay down the same quantity of mains, that is, for seven hundred and thirty-six millions. He added, that before another week they should have the certainty of obtaining a demand for the quantity estimated, as people were rapidly tying themselves down to take their gas for a term of five years.

Mr. Hope asked if that was a legal document, drawn up by some eminent counsel, by which the consumer was bound hand and foot, and enforcible even if the other companies should lower their charge to 2s.?

Mr. Croll assented. The citizens now consented to take the gas for five years, at a maximum price of 4s., and a probability of obtaining it for less. The rate of diminution of the cost of labour bore an exact proportion to the diminution of quantity within a certain limit. The cost of labour for manufacturing 1000 would, probably, be the same as for making 10,000, as one man would be required for making 10,000 feet, and they could not divide him to make 1000, although the actual amount of labour might only be one-tenth. For very large quantities, however, the ratio between the amount manufactured and the number of men employed would always be the same. He could not say exactly the number of men required to make three hundred and sixty-eight millions and the number required for one hundred and fifty-three millions; he had, however, arrived at the item of 3½d., put down in the estimate from his experience at Coventry and elsewhere.

Mr. Hope here requested Mr. Croll to go into the details of the number of men employed in the various departments of the works at Coventry, but he said he could not remember the exact numbers, but said that his Coventry manager would be put into the box and would produce all the Coventry accounts. To make two million feet a day would take 84 stokers, one-half by day and one-half at night. His pay for stokers and yardmen, &c., at Coventry was £239 a year for nineteen millions, or 3d. per 1000. And two classes of men employed, one class at 20s. a week, and another at 2s. 6d. a day. The difference between those wages and London wages would be more than one halfpenny, but the increased make would diminish that difference, so that the actual difference was just one halfpenny. In London the pay to stokers was 25s. to 28s. per week, and for purifying-men would be 2s. 6d. a day; in Coventry they were included in the charge for yardmen, and the stokers helped them. Cokemen in London would be 3s.; in Coventry the work was done by the stokers, it being very light there. At Coventry one of the stokers attended the engine; had one foreman; had no gatekeeper. At Coventry the foreman was put under the head of labour. Did not think they could take the amount paid for wages at Brick-lane as any indication, as the items were not divided in the way he had divided them in his estimates. The pay bill there was under two heads: the one, comprising stokers, labourers, &c., amounted to 2·94d. per 1000; the other, comprising lamplighters, one or two of the inspectors, men for laying down mains and service-pipes, altering and making new works, purifiers, &c., amounted to 1s. 0·37d. per 1000. In his statement these sums were distributed under other heads. The Chartered Company had employed his purifying process while he was their manager at Brick-lane, and used it still. They had also adopted his mode of setting the retorts, but abandoned it after he left. He had introduced that system, but, in consequence of the locality in which the retort-house was situated, he could not set the retorts exactly in his method, and, the pipes choking up with tar, he had to employ men to clear them out. When he left, that latter circumstance was reported to the directors, who immediately discontinued his method, although, while he had the management of the works, he had thereby effected considerable saving in the charge for fuel, and had actually received an acknowledgment of his services from the directors, and a gratuity of 100 guineas. They still continued to use his process of purification, so that on that point he should have no advantage over them, except that he proposed to use wet lime, while they used dry. When he first went to the works they were using wet lime, but it was so expensive that he recommended them to use dry lime. He had now added an exhauster, which obviated the evil. The company also made use of his dry meter. It was some of the directors of the Chartered Company who had urged him to undertake the manufacture of dry meters. The Chartered Company had upwards of 2000 of his meters, and a large quantity of Defries's dry meters. He did not know the number of wet meters they had, but it was upwards of 15,000—between 15,000 and 20,000. He himself usually placed the dry meters in the open shop, but the Chartered Company, when introducing the dry meter, usually placed it in the place from which the wet meter was taken, that was in the cellar. The advantage of the dry meter over the wet meter he had stated was, that the former could be placed in any situation, and the fittings might either ascend or descend from it, while the wet meter must be below the fittings, in order that the water carried off into the fittings might drain back into the meter. But either the wet or the dry meter must be placed between the service-pipe and the fittings, so that the trick of substituting a bladder for it, as mentioned yesterday, might be played off with a dry meter as well as a wet one. As, however, the dry meter could be placed in any open place, it would be the company's fault if such a thing were done. Intended to recommend the new company to use dry meters, but could not say whether they would agree to that recommendation. Intended to use equal amounts of clay and iron retorts. Clay retorts would last two or three years on his system. The length of duration of iron retorts depended on the mode of setting. As he set them, the iron retorts used at Tottenham had been in constant use since August, 1846. He estimated that these retorts would produce 700,000 feet each during their continuance. The average price of iron retorts of 16 cwt. would be about £5; and of clay retorts £3. 10s. A mason and a labourer would do two resettings in a fortnight. In the wear and tear of works and mains he had included wear and tear of purifiers, condensers, gasholders, and mains, breakage of pipes, tools, mechanics, labourers, oil, paint, white lead, ironmongery, casting pipes, and everything of that nature. Repaving he had put at 1s. 6d. a yard. That also was included in the 2d. for wear and tear of works and mains. That item would not vary with the consumption, as the whole amount of mains would be laid down at once. Had left an ample margin for contingencies. The wear and tear of works only would vary with the amount of consumption. For instance, the purifiers would only have to be cleaned out once in six months, instead of twice, with a consumption of one-half the estimate. With regard to the credit production account, if his plan of setting were used, only one-half the estimated quantity of coke would be used for heating the retorts, that is, 10 per cent. instead of 20. Had returned the number of meters required for a consumption of three hundred and six millions and a half at 3000, and had taken the average cost at £2. 10s. Estimated the leakage at one-sixth, which, on the price paid—4s.—would be 8d.; the cost of production and distribution for three hundred and sixty-eight millions was 3s. 0·17d.; adding the 8d. for leakage, that made the actual cost 3s. 8·17d., leaving 3·82d., &c., fraction as profit. The proposed site for the works was one mile and a half easterly from the City boundary. In the estimate for mains was four miles of 24-inch pipe. One mile supplied two gasholders right on the boundary of the City, the third proposed gasholder being to supply the districts from the works; another mile of 24-inch main supplied right into the City. The other two miles would be laid down when the increased consumption required them. These two miles would not be laid down till required. A second manufacturing station would then be erected. The pressure at the works would be twenty-tenths, and at the end of the large mains fifteen-tenths. 70,000 cubic feet an hour would pass through those mains. (The plan of the main-pipes was here put in.) He had contracted for the supply of mains at £6 and £5. 17s. 6d. a ton. Had estimated the average thickness of concrete at one foot. That was for a gravel foundation; but their proposed site would not be a gravel foundation, and Mr. Stevens had put concrete down at five feet instead of one. There would be iron bonding for walls for tying them; that was included in the £11 a rod in the estimates, the Woods and Forests price being 10 guineas. Mr. Stevens had substituted granite for brick in the estimates for paving the cokeholes. Has included pressure-gauges in the contingencies. Has included the station meter-house in the item for the station. The valves for the governor is included in the general connections. Allows for the labour of fixing, &c., under the head of general connections. The tanks are included in the charge for three tanks. Uses brick tanks. The cost of the brick tanks is £2351 each. If he could not use brick tanks, should use cast-iron tanks, which would probably cost £500 more. The brick tanks did not cost more than £2351, so that iron tanks would amount to £2831. In his brick tanks the thickness will be at the bottom 3½ bricks. Has known tanks the same diameter, but not of that thickness. The thickness at Gosport was 2½, but there the diameter is only 40 feet. Knows several gasholders of that size, but does not remember the thickness. The height of the chimney is 120 feet. The cost of the chimney is £145. The columns are standing in the puddle, that is, the foundation is surrounded by the puddle; the column is a "standard," not tripods. The height of the standard is 53 feet, that is a rise of 50 feet from the masonry. Has no trussing to his gasholder. Does not think trussing of any use. Does not know of any gasholders of the same size without trussing. His gasholders are made of thicker plates than those generally used. The plates he uses are the No. 11 for the first plate and the second, and No. 12 iron gauge for the sides and the bottom of the gasholder.

Mr. Hope said that that was all he desired to examine Mr. Croll on now; all he wished for was a plan of the mains.

Mr. Hill would consent provided Mr. Talbot on his side would do the same.

Mr. Talbot declined to assent to this.

MARCH 30.—FOURTEENTH DAY.

The Chairman stated that the committee had resolved that, after the cross-examination and re-examination of Mr. Croll, the committee would like to hear an engineer witness, to corroborate Mr. Croll on the point of gas engineering in preference to building engineering.

Mr. Croll's cross-examination was then continued.—Proposed at the distance of one mile and a half from the City boundary to have a station for the manufacture of gas, at which one gasholder would be erected; and within the limits of the City proposed to have a gasholding station at which two gasholders would be erected. Proposed from the suburban manufacturing station to lay down two

miles of 24-inch main, one for the general supply, and the other for the conveyance of gas to the gasholder in the City.

Mr. Talbot said that, having by this testimony cleared up one or two points in Mr. Croll's previous cross-examination which were not very clear, he would now take an objection which he thought must put the bill out of court.

Mr. Hill interrupted, and said the proper time would be after Mr. Croll had been re-examined.

Mr. Talbot consented to this course, and continued Mr. Croll's cross-examination, referring to the plan of mains handed in by Mr. Croll.

Mr. Croll said all the mains he proposed to lay down were marked in the map. There were, however, 42,000 yards of 2-inch main not supposed to be laid down in the first instance; there were also seven miles of courts not depicted in that plan. Had allowed 42,000 yards of piping for them at 2s. 6d. They were included in the estimate. The gross amount to be incurred in dealing with the pavement of the courts, streets, and thoroughfares of the City was 93,000 yards and 42,000 yards additional. He took the gross number of yards to which the pavement would be disturbed at 1s. 6d. There were three lines of mains in some of the principal thoroughfares, Bishopsgate-street Within; there were two 2-inch mains, one on each side of the street, and a 24-inch main along the middle of the road. In that way Bishopsgate-street would be raised in three places. That applied to Leadenhall-street, Cheapside, Fenchurch-street, Cornhill, Newgate-street, and the other principal thoroughfares of the City. A 14-inch main was marked in Fleet-street up to Temple-bar, but that was done by a mistake; and when he discovered it he had not altered it, as the smaller pipe which would be actually laid down would cost less, and thus diminish the estimate. The same mistake had been made in marking a 14-inch main along Holborn to the very verge of the City. The 18-inch main marked in Finsbury was to convey the gas from the gasholder.

Mr. Talbot: Do you wish to make the committee believe that any one knowing anything about gas would lay down a 14-inch main for a supply-pipe up to the very verge of the City, without intending to go beyond it?

Mr. Hill objected to the question.

Mr. Talbot (addressing Mr. Croll): You would never have made such a mistake.

Mr. Croll's cross-examination was then continued.—Had entered the mains into a book, putting down certain sizes of mains for particular streets, without having the plan before him. At the extremity of Farringdon-street leading out of the City there were two large mains. The gasholder station was here (pointing to map), and the works on the other side. The gasholder stations would be where most convenient; the works might be anywhere, north, south, or east. Had made provision for a supply of one-half from one gasholder station which he had selected a site for; had not looked for the other. Had no idea of supplying the districts outside the City; in fact, they had no power to do that in the bill. Had taken no steps to ascertain, beyond what he knew before, the position of the underground works in these thronged thoroughfares to which he had referred. With regard to the difficulties he should have to contend with in laying the 42,000 yards of mains and service-pipes in the seven miles of courts, from water and sewer pipes, Mr. Aird had considered that question, and would speak to it. Did not know the state of vaultage in Bishopsgate-street, but did not think it came so close to the kerb as to interfere with laying pipes along the side of the footway.

Re-examined by Mr. Hill: Did not contemplate supplying the districts out of the City. If he had, there would have been large trunk mains out of the City. It formed no necessary part of his scheme that the gasholder which he had been cross-examined about should be out of the City, nor the works either. That was a mere question of expense, as the cost of works in the City would be more expensive; but he should save in the diminished length of the main. Negotiations were actually going on for the purchase of ground for works and for gasholders in the City. Had one site for works in the south-west, in the neighbourhood of Blackfriars-bridge; and another in the east, in the direction of the Commercial-road. His large mains were laid down in that view. Where there were three sets of mains in a street, the length he spoke of meant the length of the street multiplied by 3. With regard to his estimate of five hundred and twenty millions as the total consumption of the City, he arrived at it by taking his knowledge of the rental of the Chartered Company, which for the City was £60,000, and drawing a comparison between the area they served and the area of the City Company, he estimated the rental of the latter at £90,000; these two sums made £150,000. The rental for the public light, after deducting cost of cleaning, lighting, and repairs, was £8353, which, deducted from £150,000, left £141,647. Dividing that sum by 6s., he arrived at his estimate of four hundred and sixty-eight millions for the private consumption. He arrived at his estimated demand of three hundred and six millions by considering the number of names on the share list. They must obtain one-half by the present reduction, and reckoned on receiving an addition of one-fourth in consequence of the reduction to 4s. From the number of consumers who had taken shares, and the larger number who had signed the petition, had no doubt of obtaining that quantity. Mr. Croll was then examined as to the position of his estimate, if he should have miscalculated the amount of demand. First, with regard to the cost of production, that would not be materially increased. Between a production of ten thousand and one of three hundred millions the difference would certainly be very great, but between three hundred millions and two hundred or one hundred millions the difference would not be material. The cost of distribution, however, would vary in proportion to the diminution of consumption. In his estimate it was put at 8¾d. If the consumption were diminished to one-half it would probably be 1s. But supposing there were no fair prospect of obtaining a consumption of more than one-half his estimate he should not erect so many works; for instance, he should only erect two gasholders instead of three; there would be a saving of capital in that way, and thus the sum put down for the dividend would remain the same. He would also have fewer retorts. The saving would principally be in the gasholder and retorts. The buildings he should erect on the same scale, as that would not make much difference in the dividend. He should save about £10,000 on the capital. One condenser would suffice for a consumption of one-half his estimate; purifiers of less size would do, and indeed every thing would be materially diminished. If they were certain their consumption would never be more than one-half, they would also lay down fewer mains. Their idea all along, however, was to lay down mains for the largest possible future consumption, as when the mains were once laid down they could not well be altered by night, as they bound themselves to do. Had put down the 3¼d. for labour from his experience at Coventry and elsewhere. The cost at Coventry was 3d., and he had added one-sixth for difference of wages, although the actual difference was more; but the increased size of the works diminished it again. At Coventry he was obliged, owing to the smallness of the works, to employ superior men in inferior work, but on works of the size now proposed he could put every man to the work he was best fitted for. The expense at Brick-lane would, to a certain extent, lead to erroneous conclusion, as there the space was very confined, by which extra expense was incurred, and, moreover, many items were included in the labour bill which did not properly belong to it. His mode of setting the retorts at Brick-lane had failed, because the retort-house was what was called a single house, so that there was no room for ascension-pipes; the pipes could not be carried upwards, because there were two settings on the same side. The pipes were thus necessarily descending pipes, and, being carried to the hydraulic main, which was put in the flue in the cokehole, became choked up, and he had a great deal of expense and work in keeping them clear. His only object in putting them there was to ascertain whether the principle which he wished to try would answer the purpose, and, so far as the heating of the retorts was concerned, the principle acted admirably. His purifying method was still used in Brick-lane. When he first introduced the patent he used dry lime, but since then, by using an exhauster, the difficulty he had referred to was done away with, namely, the injury resulting from a high pressure on the retorts, and therefore wet lime might be used with advantage. The Chartered Company had also used a large number of his dry meters, but since this inquiry had discontinued purchasing them. He repeated his previous statements of the advantages possessed by dry over wet meters. His mode of heating retorts effected a large saving in labour and fuel. Had put down wear and tear of retorts at 2d. When he spoke of a man and labourer making two settings in a fortnight, he meant to say that that meant 14 retorts. Wear and tear of works and mains generally was put down at 2d. If the consumption were increased to double the estimate, it would not increase the wear and tear of mains and works in the same proportion. Had set down 20 per cent. of the coke produced as to be used in heating the retorts, but considerably less would be used by his invention. The actual cost of production and distribution was 3s. ·17d. for three hundred and sixty-eight millions; to that he added 8d. and a minute fraction for leakage, making the whole cost of production of the remaining three hundred and six millions 3s. 8·99d., thus leaving 3·82d. clear surplus profit, after paying £10 per cent. dividend. The receipt from the private consumer would be 4s., but, as they undertook to do the cleaning, &c., of the public lamps, the net receipt from them would be only 3s. 3·05d. Had set down two 10-horse power engines for turning the bevel-wheels and working the exhausters. The price was £600; the exhauster would be £150, which, with gearage for the purifiers, &c., would make £750; but he had put down £1150, so as to cover a number of small things. The sum he had put down for general contingencies, £13,437, would cover all such things. Was quite satisfied with his estimates on machinery. Considering the eminence of the gas-engineering talent by which the other side was supported, he only wondered he had not been more torn to pieces than he had been. The flues would pass under the coal-stores, but completely underground, so that there could be no danger of the coals becoming heated. He also proposed to use iron bars to give a draught of air, or else to cover the floor with brickwork.

By Mr. W. Brown: An increased pressure would not be required by an increase in the size of the pipes. The larger the main the less would be the pressure required. In case of any extraordinary demand, such as for a general illumination, his increased size of main would enable him to supply his more distant consumers with more certainty.

By the Chairman: He got his figure of £86,000 by instructing the persons sent round to get names to the petition to inquire the amount of gas rental paid by each person, and from the returns thus received he had made up the total.

Mr. Talbot said they intended to dispute the accuracy of that amount.

In answer to questions from Captain Boldero, *Mr. Croll* stated he did not contemplate supplying the districts outside of the City; they had no powers under their bill. Could not say whether they were prepared to purchase the works of the existing companies if they were unable to carry on their works in competition with the cheap company. That was a question for the directors of the company. The capital of the City companies was much less than a million.

Mr. Carew: Would it not cut deep into your estimate of demand if the other companies make at 4s.?—I expect an increase of demand if the price is reduced to 4s. At Brick-lane the consumption increased £13,000 in three years after a reduction.

By Mr. Cocks: Thought there was a great field for increase in the City. There were many houses not lighted with gas which would be if the prices were reduced. In Dundee there were thirteen thousand meters, showing that number of families supplied with gas.

By the CHAIRMAN: The price prevented gas being so generally used in London as in Scotland. The price in Edinburgh was 6s. 6d., but then the gas was of double the illuminating power of that supplied in London, so that the actual price was only 3s. 3d.

By MR. W. BROWN: There was a great prejudice at one time against gas on account of its offensive smell; but that prejudice was being overcome, and many of the nobility's houses at the West end were lighted with gas. His purifying process removed all cause of offence. Cannel coal could not be used in London. Liverpool was represented by a price of 2s. 6d., owing to the superior brilliancy of the gas.

By the CHAIRMAN: Objection was also made to gas in private houses on account of the heat, but the company would adopt Professor Faraday's plan, which completely obviated that ground of objection. They proposed to supply meters and service-pipes, which would considerably reduce the cost of introducing gas into houses where it was not formerly used.

By MR. COCKS: Expected to get the public lamps, on account of the steps taken by the commissioners of sewers in behalf of this bill.

CAPTAIN BOLDERO expressed his gratification at the useful and valuable information contained in Mr. Croll's evidence, and with the ability he had displayed in the course of his long examination, for which compliment Mr. Croll expressed his gratitude and retired.

MR. TALBOT then made the objection which he had mentioned in the beginning of the day's proceedings, which was, that it was proposed, as it was elicited from Mr. Croll's evidence, to erect the works of the company at a distance of one mile and a half from the boundary of the City, while their bill expressly limited the company to the City. That objection had been anticipated by his learned friend, and its validity sanctioned by his drawing from Mr. Croll the statement that it was no part of his scheme to erect works or gasholders out of the City, and that negotiations were pending for land within the City. He submitted that the cost of procuring land of the extent required would involve an outlay that must materially invalidate the truth of Mr. Croll's estimate, and render it improbable that he should be able to supply his gas at the maximum price he had stated. He also contended that if Mr. Croll placed his manufactory at so great a distance from the City boundary, he having in this bill no compulsory power of opening streets, he might be unable to convey his gas from his manufactory into the City across the intervening distance, as the persons having authority over the roads might refuse their consent to the laying down of mains. He also submitted that the notice of the intention to apply for this bill ought to have stated the site intended to be taken for the works, in order that the parties interested might have had an opportunity of taking care of their interests. A gas-works was an establishment productive of serious injury in a sanitary point of view, and the public health ought not to be left to the discretion of a company having an ambulatory power. On these grounds he submitted that the committee ought to decide that the bill was no longer in a position to occupy their attention.

MR. HILL contended that the objection was not sustainable. The objection was one that ought to have been urged before the standing orders committee; or, at most, it could only be raised when the consideration of the clauses came before the committee. At all events it could not be argued on the preamble, but must await the discussion of the merits of the bill. With regard to the question of expense, they had an ample margin to cover the difference between the cost price of land in and out of the City. Certainly the objection came with no good grace from the old companies, whose acts were precisely similar on this point.

MR. TALBOT replied, when the room was cleared, and after a long deliberation,

The CHAIRMAN stated that the committee had come to the following resolution:—"*That the committee are of opinion that the promoters are precluded from erecting gasworks out of the city of London, or the liberties thereof.*"

APRIL 2.—FIFTEENTH DAY.

MR. JAMES said that since the decision of the committee yesterday, relative to the construction of works, the promoters had taken the matter into their most serious consideration, that they might, if possible, meet the views of the committee, and so save time upon that point of the inquiry. What the proposers had now to offer was, that they were in a position to purchase a piece of land on which their whole works could be constructed, a portion of which land was in the City, and a portion out of it; but it was such as would allow a continuous erection. The purchase-money of that land was provided for in their estimate; and, as it struck the promoters that the objection to the erection of works out of the City applied to the breaking up of the streets for laying down mains to supply the City consumption, they hoped the present offer would meet that objection. By such an arrangement no streets save those of the consumers would be interfered with, for, notwithstanding a portion of the works being a little out of the City, the mains would commence from the City part of the works.

The CHAIRMAN: The committee had come to the decision upon the construction of works according to the powers sought for in the bill.

MR. JAMES said he only had to lay the proposition before the committee, so that they might see that the promoters were willing to meet any difficulties in an early stage, for the purpose of saving time. He did not wish it to be understood that they were unable to get a site within the City, or its liberties; but, if the committee thought this proposition such as could be entertained, it would at once settle the point.

The room was ordered to be cleared, and after a brief deliberation the committee came to the following resolution:—

"*That the whole of the works should be erected in the city of London or the liberties thereof.*"

Mr. Samuel Clegg was then called, and examined by MR. PITT TAYLOR.—Was well acquainted with the production and distribution of gas. Had been engaged by the Chartered Company in 1813 to erect their works, and was at present inspector under the Woods and Forests for matters relating to gas. Had for some time been of opinion that the high price of gas in the city of London was opposed to its extension. Considered 6s. a high price in the City on account of the large consumption, and the diminished leakage arising from the concentration of the mains. Gas apparatus could now be erected cheaper than formerly, when want of experience caused the construction of works, which in a short time had to be completely rearranged. The Chartered Company's works at Peter-street had been altered four or five times since their first erection. When he first built the works there he was taken to task for laying down an 8-inch main, as being larger than would ever be required. They now had 14-inch and larger mains. Agreed with Mr. Croll that the mains cost double the sum required for the works. Had tested the illuminating power of the gas supplied in London, and found the average rather low; about a candle or a candle and a half below the standard. Had examined the Imperial Company's gas a short time ago, and found it up to the standard of 12 candles for a light of 5 feet per hour. The Chartered Company's gas was a candle and a half below the standard. The City gas was good. Had not much faith in the present method of testing by discs or with a photometer; would rather take the chemical test of ascertaining the quantity of oxygen. Thought there would be a large increased consumption if the price were reduced to 4s. in the City.

Cross-examined.—Had not been engaged in gas matters for twenty years before two years ago, but could speak from his previous experience. Could make gas and sell it with a profit of 10 per cent. for 4s. in London; and now, owing to improvements in the production of gas, and the low price of iron, he could do so for about 3d. less. Two or three years hence fresh improvements might make it necessary to reconstruct all the works now used, but he did not think the capital previously expended had anything to do with the capital they were going to expend. Was aware that in the report to the Woods and Forests he had said that the existence of two rival companies in the same town did not appear to at all benefit the consumer, but that only applied to small towns not consuming more than forty or one hundred millions a year. It did not apply to London. It would be very inconvenient to break up the streets in London for laying down fresh mains, and could not say whether that could be done by moonlight. Thought a maximum clause the only security against companies which at first started to compete in favour of the public afterwards amalgamating against the public, but there ought also to be a maximum of quality as well as of price. The latter might be nullified by a weaker article being supplied. Knew that the City and Chartered Companies had, from time to time, made reductions of price, though they had a monopoly of the City. Thought they had been compelled to do so by a pressure from without, and the fear of new companies being let in, in consequence of the popular clamour that would be raised if they did not lower their prices. Thought it unjust in principle that the public lamps should be charged at a lower rate than the private consumer, but the injustice was not so great where the proportion of the public lamps was very small in comparison with the private lights, as in the City. Did not think Mr. Croll wise in proposing to continue the system. Thought there would be considerable expansion in the sale if the price were reduced. Had no data for that opinion. Thought the consumption of London would be trebled if the price were reduced to 4s. In the Chartered Company, when the price was 15s., their rental did not cover their expenses, and they made no dividend till the price was lowered to 10s. When the price was 15s. they did not have more than 12 retorts in working. Thought the average rate of dividend in the metropolis was not more than 6 per cent. Would not invest money in gas concerns at that rate, nor at 10 per cent. either. Thought the consumption of the city of London was about four hundred millions; considered that divisible among three companies. Had superintended the construction of gasholders. A gasholder to contain 400,000 cubic feet might be contracted for at the price stated in Mr. Croll's estimate, but he should put it at £4500. Was speaking of a gasholder with a brick tank together, of a diameter of 102 feet, telescopic, and containing 412,000 feet, with its tank, supposing it to be good ground. The cost of a gasholder of 150,000 cubic feet would be £3500. The larger the size the cheaper it would be. Had known a gasholder of that size at the London Company's works at Vauxhall. Saw no necessity for a trussed roof in gasholders of that dimension. Never saw one without, but had given drawings for one of a million feet without a trussed roof. It was never constructed, but he should have no hesitation in constructing it. Had heard that the Imperial Company's gasholder, which contains 500,000 cubic feet, cost £10,000. The City gasholder cost £5000. It was all nonsense to put up tripods to support them.

Mr. Clegg was then re-examined by MR. TAYLOR, but merely repeated most of his former testimony. In answer to questions from members of the committee he stated that he had made experiments between the illuminating power of gas produced from cannel coal and that produced from common coal, and found them to be as 2 to 1. A thousand cubic feet of gas could not be produced in London from cannel coal at a less price than 5s. Cannel coal would cost 25s. a ton in London. The coke would be also of less value than that from common coal. The quantity of tar would be greater. The illuminating power of cannel coal was as 22 to 12, or thereabouts, as compared with common coal; therefore the real price would be less; but the consumer would not be satisfied to pay the higher price, as he would not understand the advantage of the superior illuminating power, while he would understand the difference of rental. There would be no inconvenience in using tar as fuel in gasworks if there was no other consumption for it. Had been told by a landlord of a number of small cottages in Liverpool that since he had fitted them with gas he not only got better rents, but also secured a better class

of tenants, who occasioned him less expense for dilapidations. In some of the neighbouring houses the tenants were known to tear up the flooring for firewood. The witness then withdrew.

Mr. E. JAMES then said he had to state to the committee that the promoters of the bill were not prepared to buy then, or to enter into a contract to purchase, four acres of land, the quantity needed for their works, within the precincts of the City. In the first place, the cost would be very large, but that was matter of minor importance compared with the evil that would be inflicted on the inhabitants of a crowded locality, such as any part of the City necessarily is, by the erection of a gasworks. He should, therefore, apply to the committee for an adjournment, to enable the promoters to petition the House of Commons for leave to insert a clause in the bill empowering them to erect works either in or out of the City.

MR. TALBOT objected that this could not be done, according to the standing orders, as by this alteration an entirely new bill was created, which it would now be too late to proceed with this session.

Mr. E. JAMES replied, after which the room was cleared.

On the parties being readmitted,

The CHAIRMAN said the committee had come to the resolution:—

"*That the committee will grant the adjournment prayed for by the promoters of the bill.*"

The committee was then adjourned until twelve o'clock on Monday, the 14th of May.

Documents produced by Mr. Croll on his Examination upon the Great Central Gas Consumers' Bill.

TABULATED STATEMENT of the Costs of Works, and also of the Cost of Production and Distribution of the Moiety, and also of the Entirety of the Gas consumed in the City, after adding the customary Increase of Consumption which follows from the Improvement of the Quality and Reduction of Price, together with the Amount of Capital and Dividend in each case.

This Tabulated Statement was laid by Mr. Croll before the Great Central Gas Consumers' Company, together with detailed Statement in support of the several items of the Account.

Mr. Croll represents that in every case he has, to the best of his judgment, overrated each item of cost.

Dr. PRODUCTION ACCOUNT.

	TOTAL COST OF PRODUCING			
	368 Million Cubic Feet of Gas, from 40,000 Tons of Coal.	736 Million Cubic Feet of Gas, from 80,000 Tons of Coal.	1000 Cubic Feet of Gas, with a Consumption of 368 Million.	1000 Cubic Feet of Gas, with a Consumption of 736 Million.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
To Coals, at 16s. per ton (producing 9200 feet per ton)	32,000 0 0	64,000 0 0	0 1 8·87	0 1 8·87
Labour, at 3¼d. per 1000 feet	5,366 13 4	10,733 6 8	0 0 3·50	0 0 3·50
Wear and tear of retorts	3,066 13 4	6,133 6 8	0 0 2·	0 0 2·
Lime	383 6 8	766 13 4	0 0 ·25	0 0 ·25
Wear and tear of works and mains	3,066 13 4	6,133 6 8	0 0 2·	0 0 2·
£	43,883 6 8	87,766 13 4	0 2 4·62	0 2 4·62

Cr. PRODUCTION ACCOUNT.

	TOTAL RESIDUAL PRODUCTS FROM			
	368 Million Cubic Feet of Gas, made from 40,000 Tons of Coal.	736 Million Cubic Feet of Gas, made from 80,000 Tons of Coal.	1000 Cubic Feet of Gas, with a Consumption of 368 Million.	1000 Cubic Feet of Gas, with a Consumption of 736 Million.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
By surplus coke (after using 20 per cent. for heating retorts) for sale, at 10s. per chaldron	16,000 0 0	32,000 0 0	0 0 10·45	0 0 10·45
Breeze (8 chaldrons per 100 tons of coals) for sale, at 4s. per chaldron	640 0 0	1,280 0 0	0 0 ·42	0 0 ·42
Tar (being 10 gallons per 1 ton of coals used) for sale, at 1d. per gallon	1,666 13 4	3,333 6 8	0 0 1·08	0 0 1·08
	..	..	..	0 0 11·95
	..	..	0 0 11·95	—
	..	36,613 6 8	—	—
	18,306 13 4	—	—	—
The cost of production will be £	25,576 13 4	51,153 6 8	0 1 4·67	0 1 4·67

Dr. DISTRIBUTION ACCOUNT.

	TOTAL COST OF DISTRIBUTION FOR			
	368 Million Cubic Feet of Gas, made from 40,000 Tons of Coal.	736 Million Cubic Feet of Gas, made from 80,000 Tons of Coal.	1000 Cubic Feet of Gas, with a Consumption of 368 Million.	1000 Cubic Feet of Gas, with a Consumption of 736 Million.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
To lighting and repairing of lamps (2678, at 15s.)	2,008 10 0	2,008 10 0	0 0 1·31	0 0 ·65
Collection and bad debts (2 per cent. on rental)	1,230 0 0	2,460 0 0	0 0 ·80	0 0 ·80
Rates and taxes (2 per cent. on rental)	1,230 0 0	2,460 0 0	0 0 ·80	0 0 ·80
Law expenses	300 0 0	500 0 0	0 0 ·20	0 0 ·16
Stationery and incidental expenses	1,200 0 0	1,500 0 0	0 0 ·78	0 0 ·49
Directors	2,000 0 0	2,000 0 0	0 0 1·30	0 0 ·65
Engineers, secretary, clerks, and inspectors	3,000 0 0	3,750 0 0	0 0 1·95	0 0 1·22
Maintenance of works (1 per cent. on capital)	1,655 0 0	2,500 0 0	0 0 1·08	0 0 ·81
Wear and tear of meters (10 per cent. on their value)	750 0 0	1,500 0 0	0 0 ·49	0 0 ·49
	..	..	..	0 0 6·07
	..	..	0 0 8·71	—
	..	18,678 10 0	—	—
	13,373 10 0	—	—	—
The cost of *production* and *distribution* will be £	38,950 3 4	69,831 16 8	0 2 1·38	0 1 10·74
Ten per cent. dividend payable on a capital of £165,500, for the manufacturing 368 million feet	16,550 0 0	..	0 0 10·79	—
Ten per cent. dividend payable on a capital of £250,000, for the manufacturing 736 million feet	..	25,000 0 0	..	0 0 8·15
Cost of *production* and *distribution*, including dividend on capital £	55,500 3 4	94,831 16 8	0 3 ·17	0 2 6·89
By sale of 368,000,000 feet of gas. Less 61,333,333 for leakage, taken at one-sixth the quantity manufactured. 306,666,667 feet, at 4s. per 1000 feet	61,333 4 0	—	0 3 3·39	—
By sale of 736,000,000 feet of gas. Less 122,666,666 for leakage, taken at one-sixth the quantity manufactured. 613,333,334 feet, at 4s. per 1000 feet	..	122,666 12 0	..	0 3 3·99
Difference, or *surplus profit*, after paying 10 per cent. dividend	5,833 0 8	27,834 15 4	0 0 3·82	0 0 9·10

Expenditure of Capital required for Producing and Distributing 368 Million Cubic Feet of Gas.

	£	s.	d.
Ground purchase	20,000	0	0
Manufacturing plant and apparatus, as per estimate	26,855	0	2
Gasholders, as per estimate	15,000	0	0
Mains, services, and meters, as per estimate	72,516	0	0
	134,371	0	2
Ten per cent. for contingencies	13,437	2	0
Preliminary expenses	8,000	0	0
Floating capital	9,000	0	0
Total	164,808	2	2

Expenditure of Capital required for Producing and Distributing 736 Million Cubic Feet of Gas.

	£	s.	d.
Ground purchase	40,000	0	0
Manufacturing plant and apparatus, as per estimate	53,710	0	4
Gasholders	30,000	0	0
Mains, services, and meters	80,016	0	0
	203,726	0	4
Ten per cent. for contingencies	20,372	12	0
Preliminary expenses	8,000	0	0
Floating capital	18,000	0	0
Total	250,098	12	4

(A.)—QUANTITIES OF BRICKWORK.

Description.	Dimensions.	Rods.	Feet.
External walls of Coal-stores	Two walls, each 180 feet long by 18 feet high and 26 inches thick, after deducting 68 blank windows, 4 feet by 6 feet 6 inches and 9 inches thick, and 68 recesses, 10 feet 6 inches by 8 feet 9 inches thick, contain	29	86
Internal walls of Coal-stores	Four walls, each 176 feet long by 22 feet 6 inches high, diminishing in thickness one brick every 6 feet in height, commencing at the base with a thickness of 21½ inches, and terminating at the top with a thickness of 13 inches, after deducting 64 openings, each 5 feet wide by 10 feet 9 inches high, commencing at the base, and 64 openings 5 feet wide by 3 feet high, in the upper thickness of the wall, contain	54	192
The walls which form Purifying-house	Two walls, each 183 feet long by 24 feet high, diminishing in thickness one brick every 6 feet in height, commencing at the base with a thickness of 26 inches, and terminating at the top with a thickness of 13 inches, after deducting 68 blank windows, 4 feet wide by 6 feet 6 inches high and 9 inches thick, and 68 recesses, 10 feet 9 inches high by 8 feet wide and 9 inches thick, contain	35	40
Partitions in Coal-stores	Sixteen partitions, each 40 feet long by 12 feet high, 13 inches thick, contain	28	64
Partitions in Purifying-house	Two walls, each 60 feet long, by an average height of 30 feet, and 13 inches thick, after deducting 8 openings, each 4 feet 6 inches wide by 7 feet high, contain	11	104
Front and back walls of Manufactory	Two walls, each 320 feet long by 24 feet high and 26 inches thick, after deducting 92 openings, 4 feet wide by 6 feet 6 inches high and 9 inches thick, and 92 openings, 8 feet wide by 10 feet 9 inches high and 18 inches thick, contain	68	80
Flue from Retorts to Chimney	One main flue (subdivided into four branches), measuring 280 feet in length by 3 feet wide, and having 3 feet for height of walls, covered with a semi-circular arch, thickness of walls and arch 9 inches, paved in the bottom 3 inches thick, contains	8	227
Evaporating Tanks	Two tanks, each 30 feet long by 20 feet wide and 5 feet high, covered with a semicircular arch, thickness of walls and arch 9 inches, bottom 13 inches in thickness, contain	9	48
Paving the entire of the Manufactory, coal-stores and under retorts excepted	Paving 73 feet by 60 feet „ 62 „ by 60 „ „ 360 „ by 41 „ less 306 feet by 11 feet, upon which the retorts stand, paving 3 inches in thickness. Paving in all, adding 1 rod for incidental, is	17	64
Piers below purifiers, and various columns through the works	Estimated at	4	0
Solids in Retorts	These consist of a wall, 350 feet long by 16 feet high and 13 inches thick	20	160
	Raised stage for retorts, consisting of 72 arches, spanned with 9-inch arch rising 1 foot, standing on walls 4 feet high and 10 feet long, each arch contains	15	29
	Haunching out arches of ovens, 4 feet high by 4 feet wide and 9 feet 6 inches long, and two courses of brickwork on top of retorts		
	Together with incidental solids, estimated at	27	0
Chimney	12 feet external diameter at base, 7 feet 6 inches external diameter at top, 120 feet high; the first 35 feet from base, 18 inches thick; the next, 40 feet 13½ inches; and the last, 45 feet 9 inches thick, contains	11	139
Boundary walls of Manufactory	1600 feet long, 10 feet high, 13 inches thick	58	224
Boundary walls of Gasholder	1000 feet long, 10 feet high, 13 inches thick	36	208
	Total measurement of brickwork	436	33

CONCRETE WORK BELOW WALLS.

		Yds.	Feet.
Condensing Seats	Two foundations, 40 feet long by 5 feet wide and 2 feet 6 inches in depth, contain	18	14
Boundary walls of Manufactory	1600 feet long by 2 feet broad and 1 foot deep, contain	118	14
Boundary walls of Gasholder	1000 feet long, 2 feet broad, and 1 foot deep	74	2
Coal-store and Purifying-house partitions	640 feet in length, 1½ feet broad, and 1 foot deep, and 120 feet long by 1½ foot broad and 1 foot deep, contain	42	6
Foundation of main walls of Manufactory	2056 feet long by 3 feet broad and 1 foot thick, contain	229	0
Solids in bottom of Retorts	349 feet long and 12 feet broad, and an average 2 feet thick	310	0
	Total measurement of concrete	792	9

Estimated Value.

	£	s.	d.
436 rods 33 feet standard brickwork, at £11 per rod	4797	10	0
792 yards 9 feet concrete, at 6s. per yard	237	14	0
Roofing, as per tender	6615	0	0
Iron flooring for Purifying-house, 26 tons, at £10 per ton	260	0	0
Beams to support flooring, estimated at 12 tons, at £10 per ton	120	0	0
Tar and ammoniacal tanks, each holding 70,000 gallons, brick-work, puddle, and excavating, complete	497	0	0
Estimated value for building	£12,527	4	0

(B.)—RETORTS AND CONNECTIONS.

MATERIALS.	WEIGHT OF EACH. cwt.	qrs.	lbs.	TOTAL. tons.	cwt.	qrs.	lbs.
252 iron retorts and mouthpieces	16	3	0	211	1	0	0
252 mouthpieces to clay retorts	1	3	20	24	1	0	0
504 ascension-pipes, 4 inches diameter, average length 20 feet	3	3	0	94	10	0	0
72 lengths of hydraulic mains	12	0	0	43	4	0	0
900 retort-lids	0	1	22	20	1	3	4
Iron joints of raised retort-stage, three to each oven; 32 ovens, 5 inches deep; and flange, 2 2 inches broad and 1 inch thick	1	3	0	9	9	0	0
Open floor-plates of retorts, raised stage covering 355½ feet by 3 feet, at 28lbs. to a foot	..	..		13	6	2	14
Pillars to support hydraulic main, 76½	2	0	14	8	2	2	7
Retort binders, two at each, and in all 8	10	0	0	4	0	0	0
36 furnace door-frames	0	3	8	1	9	2	8
36 ashpit-pans	1	1	20	2	11	1	20
360 retort sight-stoppers	0	0	15	2	8	0	24
				434	5	0	21

tons. cwt. qrs. lbs.	£.	s.	d.
434 5 0 21 at £10 per ton	4345	0	0
Concrete in foundations of retorts, measuring 4450½ square feet, and 2 feet thick, 330 solid yards, at 6s. per yard	99	0	0
6000 fire-bricks to each setting, each setting 8 feet 6 in. wide, by 14 feet high and 9 feet deep, 9-inch work, 1400, and 160 of the above to set the iron retorts included in the above 6000; 216,000 at £4. 4s. per 1000	907	4	0
252 earthen retorts, at £3. 10s. each	882	0	0
92½ tons of fire-clay, at £1 per ton	92	5	0
Workmanship of fire-brick portion of retorts	360	0	0
	£6686	5	0

(C.)—QUANTITIES OF CAST IRON IN CONDENSER.

	tons. cwt. qr. lb.	tons. cwt. qr. lb.	£ s. d.
Bottom of under box, 16 plates, B 49 by 4, 6¼ by ⅜, at 23 lbs. per foot, 4.3.5 each	3 16 2 24		
Top of under box, 16 plates, B 4.9 by 4.6¼, by ⅜ thick, at 27¾ lbs. per foot, 5.3.3¼ each	4 12 2 0		
Front and back of under box, 32 plates, C 49 by 2.0, by ⅜ thick, at 23 lbs. per foot, 2.0.12½ each	8 7 2 8		
Divisions in under box, 34 plates, D 4.0 by 2.0 and 4.1½ by 2.0, by ¼ thick, at 18½ lbs. per foot, 1.22 each	2 9 0 20		
		14 5 3 24	
128 pipes, E 9.0 by 1.6, at 11.1.0 per length	.. ..	72 0 0 0	
Botttom of upper box, 16 plates, A 3, 4.4 by 4.9, with 2 holes, 18 inches diameter each, ⅜ thick, at 23 lbs. per foot, equal to 3.3.5½ each	3 0 3 4		
Top of upper box, 16 plates, A 3, 4.9 by 4.7, by ½ thick, at 18½ lbs. per foot, equal to 3 3.16 each	3 2 1 4		
Front of upper box, 16 plates, A 5, 4.9 by 2.0, by ½ thick, at 18½ lbs. per foot, equal to 1.2.21½ each	1 7 0 8		
Back of upper box, 16 plates, A 2, 4.9 by 1.8, by ¼ thick, at 18½ lbs. per foot, equal to 1.1.18½ each	1 2 2 16		
Divisions in upper box, 34 plates, A 4, 4.3 by 1.7, by ¼ thick, at 18½ lbs. per foot, equal to 0.3.10½ each	1 8 2 22		
		10 1 1 16	
Cast-iron tank, 61.0 by 16.0 by 3.6, containing 1515 square feet, at 18½ lbs. per foot, ½ inch thick	.. ..	12 10 0 27	
15 cast-iron beams for do., at 5 cwt. each	.. ..	3 15 0 0	
Pipes for do	.. ..	18 0 2 22	
		130 13 1 5	
tons. cwt. qr. lbs. 130 13 1 5 of cast iron, at £9 per ton	.. ..	.. ..	1175 19 7
2560¾ by 550⅜ by 600⅜, equal to 3710 wrought-iron bolts, equal 3692 lbs., at 4d. per lb.	.. ..	.. ..	61 10 8
		Total....	1237 10 3

(D.)—PURIFIERS.

	tons. cwt. qrs. lbs.	£ s. d.
8 purifiers, 15 feet diameter by 3 feet 6 inches, contain 4700 feet, ⅜ inch thick, at 28 lbs. per foot	48 5 0 22	
2 dry-lime do., 12 feet square by 7 feet, contain 1066 feet, ⅜ inch thick, at 23 lbs. per foot	10 18 3 18	
Beams and columns to support do.	12 0 0 0	
	71 4 0 12	
71 tons 4 cwt. of cast iron at £10 per ton		£712 0 0
3050 bolts for do., at 73 lbs. each, 2226 lbs., at 4d.		37 2 0
	tons. cwt. qrs. lbs.	
Dash plates of 8 purifiers, measuring 14 feet diameter, each 1232 square feet, at 10 lbs. per foot	5 10 0 0	
Supporting beam cylinder and rods complete	3 0 2 0	
Agitators in all	0 10 0 0	
138 feet of shafting from steam-engine	0 12 1 8	
Dry-lime purifier covers complete	1 10 0 0	
128 sieves in dry-lime purifiers, at 74 lbs. each	4 4 2 8	
	15 7 1 16	
15 tons 7 cwt. 1 qr. of wrought iron at £24 per ton		368 14 0
		£1117 16 0

(E.)—GENERAL CONNECTIONS.

MATERIALS.	WEIGHT OF EACH. cwt. qrs. lbs.	TOTAL. tons. cwt. qrs. lbs.	£ s. d.
50 lengths of 12-inch pipe from hydraulic main to condenser	6 2 10	16 9 1 24	
72 lengths of 14-inch pipe, from condensers to purifier's connections included	9 1 0	33 6 0 0	
50 feet of 14-inch connection-pipes to purifiers	9 1 6	2 11 2 20	
60 feet of 18-inch connection-pipes to condenser in tank	11 1 0	3 15 0 0	
		56 2 0 16	
56 tons 2 cwt. 16 lbs. at £10 per ton			£561 2 6

(E. 2.)—ESTIMATE OF GASHOLDERS.

	tons. cwt. qrs. lbs.	£ s. d.
Two 4-inch angle-irons, forming water-lute of both halves, their united length 628 feet 9 inches, equal to 419 square feet, at 20lbs. to a foot	3 14 3 11	
Two 2-inch angle-irons, forming the remaining part of water-lute. Total length 634 feet 10 inches, equal to 211 square feet 7 inches, at 10 lbs. to a foot	0 18 3 15	
Two 1-inch angle-irons, making a binding selvage at water-lute. Total length 635 feet 10 inches, equal to 105 square feet 9 inches, at 10lbs. to a foot	0 9 1 24	
A 6-inch T iron at bottom, 319 feet long, containing 319 square feet, at 20lbs. to a foot	2 1 2 22	
Malleable angle-iron curb, at top 9 inches broad, 320 feet 6 inches circumference (including lap-over for joinings), ¼ inch thickness:— 482¼ square feet, 20lbs. to the foot .....9645 lbs. 24 1-inch round stays, 14 inches long .... 72 144 ¾-inch bolts, total weight 105	4 7 2 21	
Twelve trussed rods, containing 325 feet of 1-inch round iron and 300 lineal feet of 3-inch flat bar iron, and 24 ¾-inch bolts	1 1 0 14	
Twelve 6-inch flat bars, 25 feet long, ¼-inch thickness, and 24 ¾-inch bolts	1 6 3 24	
2618 square feet on sides 1249 do. top 3867 square feet, 5lbs. to a foot	49 19 3 9	
13,744 square feet on sides 6,844 do. top 20,588 square feet, 4½lbs. to a foot		
Bolts and other wrought iron in connection with gas-holder, including 24 flat bars for rollers to work upon guide-rods	4 10 2 23	
Tie rods at top	6 9 1 8	
Tons.....	75 0 2 1	
Twelve cast-iron guide-rods, 53 feet high, weight.....	35 17 1 14	

Estimated Cost.

	tons. cwt. qrs. lbs.	£ s. d.
Wrought-iron	75 0 2 1 at £24 per ton	1800 12 0
Cast-iron	35 17 1 14 at £10 „	358 12 6
Slide carriages and valves		152 0 0
118 feet sink-pipes, 14 inches diameter, 6 tons at £6		36 0 0
2 syphons		3 0 0
200 feet 14-inch pipe to connect gasholder with factory		62 0 6
Fitting 318 feet at 4s. 10d. per yard		25 12 4
		2437 17 4
20,000 extra would increase the holder		83 8 0
		£2521 5 4

(E. 3.)—ESTIMATE OF THE QUANTITIES OF BRICK AND STONE WORK FOR TANK OF GASHOLDER.

Circular Brick Wall, 26 feet high, as follows:—

	ft.	ft. in.	Mean diam. ft.	in.	Content. rods.	ft.	rods.	ft.
Bottom portion	4 by	2 6¼	106	0¼	11	118		
2nd „	5 by	2 2	105	8	12	56		
3rd „	5 by	1 9¼	105	3¼	10	36		
4th „	6 by	1 5¼	104	11¼	9	190		
5th „	6 by	1 1	104	1	7	58		
							50	186
12 piers below the guide-rods, averaging 3 ft. 6 in. by 3 ft., and 24 feet high					9	240		
Stand-pipe tank 7 ft. diameter, 9 in. thick, 30 ft. high					1	168		
Internal cone 25 high, top and bottom diameters 46 ft., and 93 ft. 9 in. thick					18	96		
Pillars to support roof					4	24		
							33	256
							84	170

	ft. in.	in.	ft.	in.	yds.	ft.	yds.	ft.
Puddle of the tank	28 6 by	18	107	8	535	11		
„ „ cone	34 3 by	12	69	6	277	10		
„ „ bottom	7 0 by	18	113	0	164	24		
„ „ stand-pipe tank	30 0 by	18	7	0	36	18		
							1014	9
Foundation-stones of tank, 3 feet by 6 inches, mean diameter 104 feet 6 inches							636	feet
Twelve stone blocks for guide-rods to rest on, 3 feet by 5 feet, and 2 feet thick							360	„
Twenty-four stone blocks for gasholder to rest on when down, 2 feet 6 inches by 1 foot 6 inches thick							30	„

Estimated Cost of Brick and Stone Work in Tank for Gasholder.

	£ s. d.
50 rods 186 feet in circular brick wall, at £15 per rod	£760 5 2
33 rods 256 feet in piers, stand-pipe tank, internal cone, and pillars, at £15 per rod	509 2 4
1014¼ solid yards of puddle, at 4s. per yard	202 17 4
636 super feet of foundation-stones in tank, at 9d. per foot	23 17 0
360 solid feet of stone blocks for guide-rods, at 2s. per foot	36 0 0
30 super feet stone blocks for gasholder, at 9d. per foot	1 2 6
6547 solid yards of excavation, at 2s. 6d. per yard	818 7 6
	£2351 11 10

N.B.—To increase the size of this tank to hold a gasholder that contains 412,000 cubic feet, will raise the cost to £2367. 8s. 4d.

(F.)—ESTIMATE OF COST OF VALVES.

		£ s. d.
Twenty-one 14-inch valves, at £10 0 0		£210 0 0
Four 12-inch	ditto £8 10 0	34 0 0
Twelve 6-inch	ditto £3 18 0	46 16 0
	Total cost	£290 16 0

(G.)—ESTIMATE OF LENGTHS, WEIGHTS, AND COST OF MAINS FOR THE PUBLIC STREETS.

Diameter in Inches.	Length in Yards.	Weight per Length.	Cost per Yard.	Weight in Tons.	Price per Ton.	Cost of Pipes.	Price of Laying per Yard.	Cost of Laying.	Total Cost.
		Cwt. qrs. lbs.	s. d.		£ s. d.	£	s. d.	£	£
24	7,040	16 2 0	34 3	2010	6 0 0	12,060	10 6	3696	15,756
18	5,133	11 0 0	22 10	977	——	5,862	8 3	2117	7,979
14	2,959	7 3 0	16 1	397	——	2,382	4 10	715	3,097
10	9,132	4 1 14	10 1	770	——	4,620	3 4	1522	6,142
8	4,770	3 2 7	7 4	294	——	1,764	2 7	615	2,379
7	1,822	3 0 0	6 2	95	——	570	2 3	205	775
6	2,496	2 1 14	5 4	103	6 10 0	682	1 10	135	817
5	5,242	1 3 14	4 2	170	——	1,105	1 7	415	1,520
4	16,226	1 1 14	3 1	386	——	2,509	1 4	1082	3,591
3	9,306	0 3 14	2 0	141	——	916	1 2	543	1,459
2	35,994	0 1 14	1 3	357	——	2,320	1 1	1950	4,270
	93,080			5700		34,790		12,995	47,785

Miles. fur. yards. 52 7 20

Paving and repairing, at 1s. 6d. per yard	6,981
Syphons, branches, and bends, 500 tons, at £10 per ton	5,000
Service-pipes and 2-inch mains, that may be required for the smaller courts, 42,000 yards, at 2s. 6d.	5,250
6000 meters	15,000
Total	£80,016

N.B.—Deduct one-half of the meters, amounting to £7500, producing £72,516, for a consumption of 368 million. For a consumption of 736 millions.

Summary of Estimates for a Consumption of 368 millions.

Ground purchase		£20,000	0 0
(A.)—Building, as per estimate	£12,527 4 0		
(B.)—Retorts and connections, ditto	6,686 5 0		
(C.)—Condensers, ditto	1,237 10 3		
(D.)—Purifiers, ditto	1,117 16 0		
(E.)—General connections, ditto	561 2 6		
Station-meter, governor, and pressure-registers, complete	1,250 0 0		
Steam-engines and exhauster, complete	1,150 0 0		
(F.)—Valves, as per estimate	290 16 0		
Tools, smiths' and carpenters' shops, and offices	1,034 6 5		
Superintendence, plans, &c.	1,000 0 0		
Total manufacturing plant and apparatus		26,855	0 2
Gasholders		15,000	0 0
(G.)—Mains, services, and meters, as per estimate		72,516	0 0
		134,371	0 2
Ten per cent. for contingencies		13,437	2 0
Preliminary expenses		8,000	0 0
Floating capital		9,000	0 0
Total capital required		£164,808	2 2

Summary of Estimates for a Consumption of 736 millions.

Ground purchase		£40,000	0 0
(A.)—Building, as per estimate	£25,054 8 0		
(B.)—Retorts and connections, ditto	13,372 10 0		
(C.)—Condensers, ditto	2,475 0 6		
(D.)—Purifiers, ditto	2,235 12 0		
(E.)—General connections, ditto	1,122 5 0		
Station-meters, governors, and pressure-registers, complete	2,500 0 0		
Steam-engines and exhausters, complete	2,300 0 0		
(F.)—Valves, as per estimate	581 12 0		
Tools, smiths' and carpenters' shops, and offices	2,068 12 10		
Superintendence, plans, &c.	2,000 0 0		
Total manufacturing plant and apparatus		53,710	0 4
Gasholders		30,000	0 0
(G.)—Mains, services, and meters, as per estimate		80,016	0 0
		203,726	0 4
Ten per cent. for contingencies		20,372	12 0
Preliminary expenses		8,000	0 0
Floating capital		18,000	0 0
Total capital required		£250,098	12 4

THE ELECTRIC LIGHT.

SIR,—I am not aware whether Mr. Staite will think himself bound at once to answer, among others, the attack of "E. L.," contained in your last number, or farther bide his time; but I, as one of the earliest promoters of the "electric light," cannot refrain from remarking in reply, that the public have been "gulled" no further by the assertions of Mr. Staite than in *believing* those assertions, which they were as free to reject or doubt. They have as yet had nothing to *pay* for any hitherto misplaced confidence—not a share has been issued, or one shilling received by the company from the public; therefore, the unworthy insinuation contained in the following remarks—viz., "that the whole proceedings have been carried on from motives not of the most disinterested character, and for the purpose of inducing the public to subscribe for shares in the company," &c.—falls at once to the ground. Such remarks would induce the world to believe that Mr. Staite, or those connected with him, had been quietly pocketing the cash, and gulling the public by the sale of a worthless article.

The exhibitions at the Hanover-square Rooms, Western Literary Institution, Cattle Show, Crosby-hall, Duke of York's Column, and National Gallery, which afforded some *little* astonishment and amazement even to the *scientific* portion of the public, are facetiously called "puppet shows" by your correspondent, simply, I presume, because they were as free of cost to the spectators as the daily exhibitions of "Mr. Punch" in our streets. The parties most interested, viz., those who have, and still continue, to provide the means for prosecuting this wonderful discovery to perfection, continue to entertain the most sanguine hopes of ultimate success. It is an affair of no ordinary importance, and may require still further time to complete; but it is progressing, and has never been at a *complete standstill*. When the goods are quite ready, and fit for sale, they will be offered to the public; in the meantime the public will not be asked to part with even the half-a-crown per share deposit.

W. C. E.

SPECIFIC-GRAVITY APPARATUS.

SIR,—It is not the first time I have heard complaints similar to those of your correspondent, "A Searcher after Truth," concerning the difference in the results given by Crosley's specific gravity apparatus and my own, and I am glad of the opportunity thus afforded me of giving some explanation on the matter.

I believe the differences alluded to are caused by the want o delicacy and the great difficulty in getting a perfect result by the flask apparatus; in addition to which the flask is liable to have a deposit left in it of watery vapour from the current passed through causing a continual alteration in its weight. In many experiments I have lately made I find that, with great care in the manipulation, London gas gave 370 and 390 with Crosley's, and 380 (the mean) with my own.

To demonstrate that this is so, I shall be happy to meet your correspondent, and, if agreeable, appoint some eminent engineer to witness and report upon our experiments.

55, Millbank-street, Westminster. A. WRIGHT.

Miscellaneous News.

THE ELECTRIC LIGHT.—Mr. Henry M. Payne, of Worcester, Massachusetts, informs the *Scientific American* that he has discovered a means of generating light, by mechanical action, from water and lime. Mr. Payne says—"I have continued the experiment at intervals, and I am now enabled to announce a successful result. I have produced a light equal in intensity to that of 4000 gasburners of the largest batwing pattern, with an apparatus occupying four square feet of room, at a cost of 1 mill. per hour; the current of electricity being evolved by the action of the machinery wound up with a common lock key, and the only materials consumed are water and lime. I am now engaged in making an apparatus for public exhibition, which will be completed this winter, and all its parts submitted to public inspection, except the interior of the generator.

ARTIFICIAL LIGHT.—At the last meeting of the Ashmolean Society, Dr. Daubeny exhibited an apparatus to show an easy method of producing a light, capable of superseding oil, or even gas, simply by passing a stream of atmospheric air through inflammable liquids of a volatile nature, such as ether, or the liquor condensed in the preparation of oil gas.

BEDFORD COUNTY PRISON.—The county magistrates have accepted the tender of an individual to supply all the gas required for the county gaol, for a period of twenty-one years, at 5s. per 1000 feet. The quantity annually consumed is about 200,000 cubic feet, giving a rental of about £50,—rather a doubtful speculation we suspect.

VULCANIZED INDIARUBBER.—There seems no limit to the uses to which this article may be applied. Jennings's gascocks and valves are an instance of this, and, as they are now extensively used at the new Houses of Parliament and elsewhere with great success, their utility is practically demonstrated.

Share List.

THE PRICES QUOTED ARE THOSE AT WHICH THE LAST SALES HAVE BEEN MADE.

The Companies whose names are printed in italic type are incorporated by Act of Parliament.

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£	**ENGLAND.**	£ s. d	£ s. d	£ s. d
		Abergavenny			
		Aberystwith			
		Abingdon			
		Accrington £5500		5 0 0	
		Alcester			
		Alford, Lincolnsh.			
		Alfreton			
		Alnwick			
		Alresford, Hants.			
		Alston Moor			
		Alton			
800	5	Altrincham	5 0 0		
		Amlwch			
		Ampthill			
350	10	Andover	10 0 0	5 0 0	10 0 0
		Appleby			
		Arundel			
		Ashbourn, Derby			
		Ashburton			
		Ashby-de-la-Zouch			
		Ashford, Kent			
		Ashton-under-Line £42,500		13 4 0	
		Atherstone			
		Axbridge, Somerst.			
		Axminster			
225	20	Aylesbury	20 0 0	5 0 0	20 0 0
		Aylsham, Norfolk			
		Bacup, Yorkshire			
		Bakewell			
		Baldock			
		Banbury			
		Bangor			
500	5	Barking, Essex	4 10 0	5 11 0	5 0 0
250	10	Barnard Castle	10 0 0	5 10 0	10 15 0
		Barnet			
		Barnsley £6000		9 0 0	
100	20	Barnstaple	20 0 0	7 10 0	25 0 0
120	25	Basingstoke	25 0 0	8 0 0	28 0 0
2400	20	*Bath*	16 0 0	10 0 0	21 to 23
		Battle £2000		6 0 0	
56	26½	Bawtry	26 10 0	5 0 0	25 0 0
		Beccles, Bungay, and Lowestoft			
		Bedford			
		Bedale, Yorkshire			
		Belper			
		Beminster			
700	5½	Berwick-on-Tweed	5 10 0	6 8 0	5 15 0
		Beverley			
		Bewdley			
280	10	Bideford	10 0 0	6 0 0	10 10 0
		Biggleswade			
		Bicester			
		Bilston £25,000			
		Billericay			
		Bingley			
		Birkenhead and Claughton £56353	35 0 0	3 7 6	32 to 34
2400	50	*Birmingham and Staffordshire*	50 0 0	8 0 0	64 to 66
	25	*Ditto*, new shares	7 10 0	8 0 0	10½ to 11½
704	75	Birmingham	75 0 0	6 13 4	108 to 110
		Bishop's Auckland			
		Bishop's Stortford			
		Blackburn £24,000		8 0 0	
		Blandford			
		Blythe			
		Bodmin			
		Bolton £49,500		9 0 0	
		Boroughbridge			
		Boston £8000		6 0 0	
200	10	Bourn	10 0 0	5 0 0	
		Bradford, Wilts			
		Bradford, Yorksh. £45,000		10 0 0	
		Brampton, Cumb.			
		Brandon, Suffolk			
		Brecon			
		Bridge-end, Glam.			
		Brierly Hill			
2250	20	*Brighton*	20 0 0	5 0 0	16to16 10
1125	20	,, new shares	16 0 0	5 0 0	
		Brighton and Hove £50,276			
4250	20	*Bristol*	20 0 0	10 0 0	37 to 39
1630	25	*Bristol and Clifton*	25 0 0	6 0 0	25 0 0
		Brixham			
		Braintree			
750	50	*Brentford*	50 0 0	6 0 0	47 to 48
800	25	,, new shares	11 0 0	6 0 0	11 0 0
		Brentwood			
		Bridgnorth			
		Bridgwater £6000		5 0 0	
400	10	Bridlington	10 0 0		8 0 0
		Bridport			
		Brigg			
		Broadstairs			
100	50	Bromley, Kent	50 0 0	6 0 0	52 10 0
		Bromsgrove			
		Bromyard			
		Broseley			
120	10	Bruton	10 0 0	4 0 0	8 0 0
100	25	Buckingham	25 0 0	5 0 0	25 0 0
		Bungay (see Beccles)			
		Burford			
		Burlington			
		Burnley £19,946			
		Burslem			
		Burton-on-Trent			
		Bury St. Edmund's			
		Bury, Lancashire £6570			
		Buxton			
		Caistor, Lincoln			
		Calne, Wilts			
		Camborne			
		Cambridge £32,000		7 0 0	
240	50	*Canterbury* Gas and Water	50 0 0	6 0 0	57 to 58
240	25	*Ditto*, second issue	25 0 0	6 0 0	25 0 0
		Cardiff £10,500		7 10 0	
		Cardigan			
		Carlisle £9000		8 0 0	
		Carmarthen			
		Carnarvon			
		Castle Cary			
		Chapel on the Frith			
		Chard			
		Chatham (see Rochester)			
		Chatteris			
		Cheadle			
		Chelmsford			
		Cheltenham £17,242 10s.		8 10 0	
		Chepstow			
		Chertsey			
		Chesham, Bucks			
		Chester			
		Chesterfield £12,023 14s. 1d.			
240	25	Chichester	25 0 0	6 0 0	30 0 0
		Chippenham			
		Chipping Norton			
		Chorley			
		Cirencester			
		Clare			
		Clifton (*Bristol and Clifton*)			
		Cleckheaton, York.			
		Clitheroe			
		Cockermouth			
		Colchester			
		Coleshill, Warwic.			
		Colne, Lancashire			
		Colebrook Dale, Salop			
		Coleford, Gloster			
		Coggeshall			
		Congleton £5000		7 10 0	
		Conway			
		Cowbridge			
800	25	*Coventry*	25 0 0	5 0 0	20 0 0
		Cowes			
		Crewkerne			
		Croydon			
		Cranbrook £1900		5 0 0	
		Crediton			
		Crewe, Cheshire			
		Crickhowell			
		Darlaston			
		Darlington			
250	20	Dartford	20 0 0	7 10 0	27 0 0
		Dartmouth			
125	20	Daventry	20 0 0	6 0 0	24 8 0
500	6	Denbigh	6 0 0	5 0 0	6 0 0
820	10	Deptford, Bermondsey, and Rotherhithe	10 0 0	5 0 0	4 10 0
		Derby £16,250		7 10 0	
90	20	Dereham (East)	20 0 0	4 10 0	
1000	5	*Dewsbury*	5 0 0	7 10 0	8 12 6
		Devizes			
4000	5	*Devonport*	5 0 0	4 0 0	5 14 0
		Diss			
		Doncaster			
280	25	Dorchester	25 0 0	5 0 0	25 0 0
120	25	Dorking	20 10 0	5 0 0	21 10 0
		Douglas, Isle of M.			
209	56½	*Dover*	56 10 0	6 0 0	56 10 0
		Downham			
		Driffield			
		Droitwich			
600	20	*Dudley*	20 0 0	4 0 0	16 to 18
		Dunmow			
		Dunstable			
		Durham			
276	9	Dursley, Gloster	9 0 0	5 10 0	8 0 0
		Easingwold			
		Elland			
		Ellesmere			
300	19	Epsom	19 0 0		
		Evesham			
		Exeter £40,000		8 0 0	
		Exmouth			
		Eye, Suffolk			
		Fakenham			
		Falmouth			
		Fareham			
120	25	Farnham	25 0 0	10 0 0	42 0 0
		Farringdon			
		Farsley			
		Faversham			
		Fleetwood			
		Folkestone			
		Frome			
		Gainsborough			
		Gillingham, Dorset			
		Glastonbury			
		Glossop £6000		7 0 0	
		Gloucester £24,600		7 10 0	
		Godalming			
		Gosport			
1000	10	*Great Grimsby*	6 10 0	8 0 0	8 5 0
		Guildford			
		Guisborough			
		Hadleigh			
300	6	Hales Owen	6 0 0	7 10 0	5 10 0
		Halifax £15,000		8 0 0	
		Halstead			
		Harleston			
		Harrogate £10,000			
		Hartlepool £7835		7 0 0	
		Haslingden, Lancsh			
330	50	Hastings and St. Leonard's	50 0 0	6 0 0	60 0 0
		Haverfordwest			
		Haverhill			
		Haworth, Yorks.			
		Helstone			
		Hemel Hempstead			
300	10	Henley-on-Thams.	10 0 0		
		Hereford £5300		4 0 0	
		Herne Bay			
270	10	Hexham	10 0 0	7 0 0	12 0 0
		Heywood £10,000		7 10 0	
230	10	Hinckley	10 0 0	5 0 0	7 0 0
		Hindley, Lancash.			
		Hitchen			
		Hythe			
		Holbeach			
		Holmfirth £8325		6 0 0	
		Holyhead			
		Holywell (see British Provincial)			
		Honiton			
		Horncastle			
		Houghton-le-Sprg.			
		Horsham			
		Howden			
		Hull, Sculcoats (see British Provin.)			
		Hull, Broadley-st. £11,712. 10s.		8 0 0	
		Hungerford			
		Huntingdon			
		Huddersfield			
520	5	High Wycombe	5 0 0		5 0 0
		Hyde, Cheshire			
		Ilminster			
		Ilford			
		Ilfracombe			
		Ironbridge			
1400	10	*Ipswich*	10 0 0	8 0 0	15 0 0
1100	10	,, new shares	5 0 0	8 0 0	
800	25	*Isle of Thanet* (Ramsgate&Mar.)	20 0 0	5 0 0	17½ to 18
		Kendal £7600		7 10 0	
		Kenilworth			
		Keswick			
100	25	Kettering	25 0 0	5 0 0	25 0 0
		Kiddermins. £8000		5 0 0	
		King's Langley			
		Kington, Hereford			
		Kirby Lonsdale			
		Knutsford			
		Llanelly			
		Llandaff			
		Lampeter			
		Llandilo			
		Llandovery			
		Launceston			
		Leamington Priors £20,000		6 0 0	
		Ledbury			
		Leeds Old Comp. old stk., £60,300		10 0 0	
		new ,, £11,527		6 0 0	
		Leeds New Comp.			
		Leek			
		Leicester		7 0 0	
		Leigh			
125	20	Leighton Buzzard	20 0 0	5 0 0	
		Leominster			
		Leyburn, Yorksh.			
		Liskeard			
330	25	Lewes	25 0 0	5 0 0	23 0 0
		Lincoln £8000		10 0 0	
		Leyland, Lancash.			
		Lichfield			
		Liverpool United	100 0 0	10 0 0	{146 to 148
		,, ¼ sh.	25 0 0	10 0 0	32 to 34
		Langport			
		London Comps.—			
5000	40	*British*	18 0 0	5 11 1	13 to 15
		,, debentures		4 0 0	
5000	20	,, Prov.—(Ayr, Clonmel, Gloucester, Holywell, Hull, Norwich, Stoke, Trowbridg)	20 0 0	7 0 0	19 to 21
	20	,, Prov., new	3 0 0	7 0 0	3 to 3½
	25	*Commercial*	25 0 0	5 10 0	25 to 26
	25	,, new shres	10 0 0	5 10 0	pr.to½pm.
	25	,, ,,	2 10 0	5 10 0	pr.to½pm.
12,000	50	*Chartered*	50 0 0	6 0 0	45 to 47
6000	50	,, new shares	10 0 0	6 0 0	9 to 9½
1000	100	*City of London*	100 0 0	10 0 0	240 0 0
1000	100	,, new shares	75 0 0	10 0 0	210 0 0
4000	50	*Equitable*	50 0 0	4 10 0	32 0 0
10,000	20	European—(Amiens, Bou-			

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£		£ s. d	£ s. d	£ s. d
		logne, Caen, Havre, Nantes, and Rouen)	20 0 0		9 to 10
8000	50	*Impl. Continental* —(Amsterdam, Aix-la-Chapelle Antwerp, Berlin, Bordeaux, Brussels, Cologne, Frankft., Ghent, Haarlem Hanover, Lille, Marseilles, Rotterdam, Toulouse, Vienna)	42 0 0		35 to 37
7000	50	„ new shares	38 0 0		38 to 40
	50	„ third issue	42 10 0		52 to 55
10,000	50	*Imperial*	50 0 0	6 0 0	61 to 66
		„ debentures			
4000	40	*Independent* ...	40 0 0	6 0 0	60 to 62
3000	50	*London*	50 0 0		10 to 20
3000	50	„ preference	50 0 0		20 to 30
9000	50	*Phœnix*	47 0 0	5 0 0	28 to 30
320	50	*Poplar*	50 0 0	4 0 0	28 to 30
1000	100	*Ratcliff*	90 0 0	5 0 0	73 to 75
4000	25	*South Metrop.* ...	25 0 0	6 0 0	21 to 23
9000	50	UnitedGeneral—(Cork, Dublin, Limerick)	50 0 0	2 10	13 to 13
12,500	20	Western	10 0 0		
		Lostwithiel			
		Loughborough			
240	25	*Louth*	25 0 0	6 0 0	26 10 0
		Lowestoft (see Beccles)			
611	5	Ludlow Union	5 0 0	6 0 0	5 0 0
		Luton			
		Lyme Regis			
		Lymington			
		Malmesbury			
		Macclesfield £20,000		4 13 5	
		Maidenhead			
250	50	Maidstone	50 0 0	10 0 0	100 0 0
		Maldon			
		Marlborough			
		Malton (New)			
		Manningtree			
		Mansfield £5000		10 0 0	
		March			
		Margate (see Isle of Thanet)			
		Market Bosworth...			
		Market Deeping...			
132	25	Market Harboro' ...	25 0 0	6 0 0	30 0 0
		Market Raisin.....			
		Market Weighton ...			
		Marlow			
370	10	Maryport	10 0 0	6 0 0	12 0 0
		Melksham.....			
		Melton Mowbray .			
		Merthyr Tydvil ...			
		Mere			
		Middleton £5000			
		Midsummer Norton			
		Middlesboro'			
		Mildenhall			
		Milford Haven.....			
		Minchinhampton .			
		Mold			
700	10	Monmouth Gas and Water.....	10 0 0	4 0 0	
		Monk Wearmouth			
		Moreton in the Marsh			
		Nantwich			
		Neath.....			
		Needham Market..			
		Newark £5000		10 0 0	
		Newbury			
13,000	5	Newcastle & Gateshead Union	5 0 0	10 0 0	6 12 6
		Newcastle-under-Lyne £5000		5 0 0	
600	5	Newmarket	5 0 0	6 0 0	5 0 0
		Newnham, Gloster			
		New Mills & Hayfield £2115			
		Newport, Monmouthshire			
320	50	*Newport, Isle of Wight*	38 0 0	4 0 0	21 to 23
		Newport Pagnell			
		Newport, Salop ...			
		Newton Abbot.....			
		Newton, Lancash.			
		Northallerton			
		North Walsham ...			
		Northampton			
		Northwich			
		Norwich (see British Provincial)			
		Nottingham £42,500		10 0 0	
		Nuneaton			
		Oakham.....			
		Oakhampton			
200	10	Odiham, Hants.....	10 0 0		10 0 0
		Oldham			
		Ongar.....			
		Ormskirk			
		Otley, Yorkshire...			
		Oundle			
		Oxford £18,000		9 10 0	
		Over Darwen £8000		5 0 0	
		Pately Bridge, Yorkshire.....			
		Pembroke.....			
250	20	Penrith	15 0 0	6 10 0	21 0 0
		Penryn			
		Penzance			

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£		£ s. d	£ s. d	£ s. d
200	10	Petworth	10 0 0	9 10 0	14 10 0
		Pickering			
3000	10	*Plymouth & Stonehouse*	10 0 0	6 0 0	11 0 0
		Pocklington			
		Pontefract.....			
400	10	Poole	10 0 0	5 0 0	10 0 0
		Port Madoc.....			
600	50	*Portsea Island* ...	53 0 0	5 0 0	47 to 49
400	10	Prescott.....	9 0 0	4 13 4	7 0 0
		Preston £52,500		10 0 0	
		Presteign.....			
		Pwllheli.....			
		Pontypool.....			
		Pudsey			
		Radcliff and Pilkington £9000		4 12 10	
		Ramsay, I. of Man			
		Ramsgate (see Isle of Thanet).....			
		Reading £10,190		3 0 0	
		Reading Union ...			
		Redditch			
		Redruth.....			
		Reigate			
		Retford (East).....			
		Richmond, Surrey			
		Ripon.....			
		Rochester and Chatham £14,000		6 0 0	
		Rochford			
		Rockingham.....			
		Ross			
		Rotherham £4000		10 0 0	
		Royston.....			
		Rugby			
		Rugeley.....			
		Ruthin.....			
		Runcorn.....			
500	10	Ryde	10 0 0	6 0 0	12 0 0
		Rye.....			
		Romsey			
		Saddleworth.....			
225	20	Saffron Walden ...	20 0 0	3 15 0	19 0 0
		St. Austel			
		St. Colomb			
		St. Helen's £7200		5 0 0	
		St. Ives, Huntingd.			
		St. Ives, Cornwall			
		St. Neot's			
		Salisbury			
		Sandbach			
		Saxmundham			
		Scarborough.....			
		Selby			
		Settle			
290	10	Sevenoaks.....	10 0 0	5 0 0	10 0 0
		Shaftesbury			
5400	25	*Sheffield United* ...	24 0 0	8 6 4	32 0 0
		Shelton, Potteries (see Brit. Prov.)			
		Shepton Mallet ...			
		Sherborne.....			
2914	5	Shields, North (Tynemouth) ...	5 0 0	3 0 0	5 0 0
		Shields (South) ...			
		Shiffnal, Salop			
		Shipley			
		Shipston-on-Stour			
		Shrewsbury £10,000		7 0 0	
		Skipton			
		Sleaford			
		Somerton			
		Southam			
		Southwold.....			
		South Molton			
1000	50	*Southampton*			
		Sowerby, Yorksh.			
		Stokesly.....			
		Stafford £10,000			
		Staines and Egham			
		Staley Bridge £15,000		10 0 0	
		Stamford £11,250			
		Stockport £34,200		7 11 0	
		Stockton-on-Tees £3600		8 0 0	
840	9 10	Stockton, New	9 10 0	8 0 0	
960	10	Stoke-upon-Trent	10 0 0	6 10 0	12 0 0
500	10	„ new shares	3 0 0	6 10 0	5 0 0
		Stone, Stafford.....			
		Stoney Stratford...			
		Stourbridge			
		Stowmarket.....			
		Stratford-on-Avon			
		Stroud			
		Sturminster.....			
169	10	Swaffham.....	10 0 0	5 0 0	5 10 0
		Swansea £9000			
		Sudbury.....			
		Sunderland, old....			
6400	5	Sunderland, new ..	5 0 0		
		Swindon.....			
2800	5	*Taunton*.....	5 0 0		2 10 0
		Tadcaster			
		Tamworth.....			
		Tavistock.....			
		Teignmouth.....			
		Tenbury.....			
		Tenby.....			
		Tenterden £2000		2 10 0	
		Tetbury, Gloster...			
		Tewkesbury			
		Thame.....			
		Thetford			
		Thirsk			
		Thornbury			
		Thorne			
		Tiverton			
670	5	Todmorden	3 0 6		
		Torquay.....			
		Torrington, Devon			
		Totness			

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£		£ s. d	£ s. d	£ s. d
		Tottenham		6 0 0	
		Towcester.....			
		Tring			
		Trowbridge (see British Provinl.)			
75	50	Truro	50 0 0	2 0 0	
		Tunbridge.....			
		Tunbridge Wells...			
		Ulverston.....			
		Uppingham			
		Usk, Monmouth ...			
		Uttoxeter.....			
		Uxbridge			
1000	25	*Wakefield*, old capl.	25 0 0	6 0 0	24 0 0
1600	5	„ new „	5 0 0	6 0 0	4 16 0
		Walsall.....			
300	10	Wallingford	10 0 0	2 10 0	8 0 0
		Wandsworth.....			
		Wantage.....			
		Warrington £18000		10 0 0	
100	10	Wareham	10 0 0	3 10 0	8 0 0
120	25	Warminster	25 0 0	5 0 0	27 0
		Warth			
		Warwick £15,000		6 0 0	
		Watford.....			
		Welchpool, Mntgy.			
		Wellingborough ...			
		Wellington, Salop			
		Wellington, Smrst.			
		Wells, Smrst. £4000		6 0 0	
		Wenlock.....			
		Westbury.....			
		Weston-sup.-Mare			
2000	5	West Ham	5 0 0	4 0 0	5 0 0
		Whitby.....			
		Whitehaven			
		Whittlesea			
		Wigan £10,160		5 0 0	
		Willenhall.....			
		Winchelsea.....			
		Winslow			
240	10	Wimborne Minster	10 0 0		
		Wincanton.....			
		Winchester			
900	12½	Windsor.....	12 10 0	10 0 0	23 0 0
		Witham.....			
		Witney.....			
4448	10	*Wolverhampton*, ...	10 0 0	7 10 0	11 10 0
		Woburn.....			
		Wokingham			
		Woodbridge			
		Wotton-un.-Edge			
		Worcester.....			
		Workington			
		Worksop.....			
		Wirksworth			
		Worthing.....			
		Wrexham			
		Woolwich			
		Woolwich Consms.			
		Wymondham.....			
		Yarm			
795	20	Yarmouth.....	20 0 0		15 to 16
		Yeovil			
		York Untd. £35,000			

SCOTLAND.

		Aberdeen			
		Airdrie			
		Alloa			
		Anstruther.....			
		Ardrossan, nr. Saltcoats			
550	20	Arbroath	20 0 0	7 10 0	27 10 0
		Auchterarder.....			
		Auchtermuchty			
		Ayr, old (see Brit. Provincial).....			
		Ditto, new.....			
		Banff			
		Bathgate.....			
		Beith.....			
		Boggar.....			
250	6	Borrowstowness ...	6 0 0	5 0 0	8 0 0
		Brechin			
		Broughty Ferry, near Dundee.....			
		Burntisland			
		Campbelton.....			
		Clackmannan, near Alloa			
		Coatbridge.....			
		Coldstream			
		Collinsburgh			
		Crieff.....			
		Crail, Fife			
		Cumbernauld, near Glasgow.....			
600	5	Cupar Angus	5 0 0	6 0 0	5 10 0
250	10	Cupar Fife	10 0 0	7 10 0	14 0 0
		Dalkeith			
		Dingwall.....			
		Dumbarton.....			
400	20	Dumfries	14 0 0	5 0 0	20 0 0
		Dunbar.....			
		Dunblane.....			
		Dundee, old			
		„ new			
860	10	Dunfermline.....	10 0 0	6 0 0	12 12 0
		Dunkeld			
		Dunse.....			
		Dysart.....			
6000	25	*Edinburgh Gas Co.*	25 0 0	10 0 0	45 0 0
		„ *and Leith Co.* £150,000		6 10 0	
		Elie.....			
		Elgin.....			
		Falkirk, old			
		„ new.....			
		Falkland.....			

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£		£ s. d	£ s. d	£ s. d
		Ferry Port on Craig, Fife			
		Forfar			
		Fort William			
		Fraserburgh			
		Galashiels			
		Girvan			
		Glasgow £122,500		5 0 0	
15000	10	*Glasgow City and Suburban*	9 0 0	7 10 0	9 0 0
		Grangemouth			
		Greenock			
		Haddington			
		Hamilton			
		Hawick			
		Helensburgh			
		Inverary			
400	1	Inverkeithing	1 0 0	5 0 0	1 0 0
1200	10	*Inverness Gas and Water*	10 0 0	8 0 0	15 0 0
2400	5	„ new shares	1 5 0	8 0 0	2 5 0
		Irvine			
		Jedburgh			
		Keith			
		Kelso			
		Kilmarnock			
		Kinghorn			
		Kingskittlo, Fife			
		Kinross			
		Kirkaldy			
320	5	Kirkcudbright	5 0 0	5 0 0	5 0 0
1000	3	Kirkintilloch, near Glasgow	3 0 0	5 0 0	3 0 0
227	5	Kirkwall	5 0 0	5 0 0	4 10 0
518	5	Kirriemuir	5 0 0	6 0 0	
		Lanark			
		Largo, near Leven			
		Largs			
		Lasswade, n. Edinburgh			
		Lauder			
		Leith			
		Leslie, Fife			
		Lesmahago			
		Leven			
		Linlithgow			
		Linton, n. Nobleh.			
		Lochee, n. Dundee			
		Lochgilphead			
		Lochwinnock, near Paisley			
		Mauchline			
		Maxwell-town, n. Dumfries			
		Melrose			
718	2	Mid & East Calder	2 0 0		2 0 0
192	5	Moffat	5 0 0		
		Montrose			
		Musselburgh			
		Muirkirk			
		Nairn			
		Neilston, n. Glasg.			
		Newburgh, Fife			
		Newton Stewart			
		North Berwick, n. Haddington			
		North Queensferry			
		Oban			
		Peebles			
800	25	Perth	25 0 0	1 4 0	22 10 0
		Peterhead			
		Pittenweem			
		Pollokshaws, near Glasgow			
		Port Glasgow			
		Portobello, near Edinburgh			
		Prestonpans			
		Renfrew, n. Paisley			
		Saltcoats			
		Selkirk			
		South Queensferry			
		St. Andrew's			
		Stewarton			
		Stirling			
		Stonehaven			
		Stranraer			
		Strathaven, near Hamilton			
		Thurso			
		Tillicoultry, near Alloa			
800	1	Tranent	1 0 0		1 0 0
		Troon			
		Wick			
		Wigton			
		Wemyss		4 10 0	
		IRELAND.			
300	10	Armagh	10 0 0	8 0 0	14 10 0
700	50	*Belfast*	50 0 0		
		Ballymena			
		Cashel			
		Carlow, new			
		Cork (see United General)			
		Coleraine			
		Clonmel (see British Provincial)			
		Drogheda			
		Dublin Consumers £190,000		7 0 0	
		Dublin Hibernian (see United Gen.)			
160	25	Dundalk	25 0 0		22 0 0
		Dungannon			
		Downpatrick			
		Galway			
400	10	Kilkenny	10 0 0	8 0 0	11 5 0
		Limerick (see United General)			
1725	5	Limerick Consumers	5 0 0	5 0 0	5 0 0
600	15	Londonderry	15 0 0	6 13 4	21 10 0
		Lisburn			
520	10	Lurgan	6 0 0	6 0 0	6 0 0
		Nenagh			
448	5	Newtownards	5 0 0	4 0 0	5 0 0
		Newry			
125	20	Portadown	13 0 0		
		Sligo			
		Waterford			
		Wexford			

The Gas Works in the undermentioned towns belong to private individuals:—

Carlow, old. Deal. Ely. Goole. Hertford. Holt. Kingston-on-Thames. Lancaster. Lynn. Morpeth. Oswestry. Peterborough St. Alban's. Sandwich. St. Helier's, Jersey. Sheerness. Sidmouth. Sittingbourne. St. Peter's Port, Guernsey. Spalding. Romford. Waltham Abbey. Ware. Wem. Weymouth. Whitchurch(Salop). Wisbeach.

The Gas Works belong to the Corporations, or to Commissioners acting under special acts of Parliament, in the following towns:—

Keighly. Knaresborough. Manchester. Milton (Kent). Paisley. Rochdale. Rothesay. Richmond (Yorkshire). Salford. Strabane. Wells (Norfolk).

*** We should feel greatly obliged by agents, or others interested, furnishing us with such corrections for our Share List as we may not have received through our usual channels of communication; our object being to present as accurate a list of prices as can be obtained; to procure which, we solicit the aid of correspondents in general.

Price Current.

The following List of Prices is corrected by an eminent wholesale house in each trade up to the latest period:—

CASTINGS, per Ton.

Average Weight of Cast Iron Pipes, per Yard.

1½ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow	Newcastle.	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1	3 7 6	2 12 6	3 0 0	3 15 0	3 10 0
1½ and 2 inches Socket Pipes	6 0 0	5 0 0	5 10 0	5 15 0	5 15 0
2½ and 3 do. do.	5 17 6	4 17 6	5 7 6	5 12 6	5 12 6
4 and 5 do. do.	5 15 0	4 15 0	5 5 0	5 10 0	5 10 0
5 inches and upwards do.	5 12 6	4 15 0	5 2 6	5 7 6	5 7 6
Extra for bends, branches, and connection	2 0 0	2 0 0	2 0 0	2 0 0	2 0 0
Retorts, 1st fusion	5 2 6	..	..	4 17 6	5 0 0
Do. 2nd fusion	5 7 6	4 10 0	4 17 6	5 5 0	5 5 0
Tank Plates, ⅝ thick and above	5 10 0	4 17 6	5 0 0	5 7 6	5 7 6
Do. less than ⅝	5 15 0	5 0 0	5 5 0	..	5 10 0
Plain Castings ex. models	5 15 0	5 0 0	5 5 0	5 10 0	5 10 0

COALS.

NEWCASTLE. Unscreened.	s.	d.	
Tyne Main	5	6	per ton.
Ravensworth Pelaw, Dean's Primrose, Pelton, Medomsley, New Tanfield	5	9	„
	6	0	„
Pelaw	6	3	„
Eighton Moor, Felling Main, Hutt's Tanfield, New Pelton, Peareth, South Pelaw, Waldridge, South Peareth, South Pontop	6	6	„
Ramsay's Cannel	15	0	„

DERBYSHIRE. Unscreened.	s.	d.	
Clay Cross, Deep Main, Jerries, New Birchwood, New Shipley, Sleight's, Soft Main	6	6	per ton.

SCOTCH CANNEL.			
Kirkness best	23	0	„
Ditto seconds	14	0	„
Lothian	18	0	„
Lesmahago	16	0	„
Wemyss	15	0	„
Dombristle, Lethans	12	0	„
Bridgeness, Kinneil	11	0	„
Lochgelly, Lumphumans	10	0	„

FIRE GOODS.

Best Fire Bricks, 60s. per thousand, at Newcastle.
Do. Clay, 12s. per ton do.

WROUGHT IRON TUBING, subject to 25 per cent. Discount.

	2 inches.	1½ inch.	1¼ inch.	1 inch.	¾ inch.	½ inch.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent welded tubes, from 4 to 12 feet, per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto „ 2 to 4 feet	One	penny	per foot	extra.		
Ditto „ 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting pieces, or long screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Springs, wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Elbows, wrought or cast	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing sockets	1 3	0 9	0 8	0 6	0 5	0 4
Plain sockets	1 0	0 8	0 7	0 5	0 4	0 3
Caps, plugs, nipples, backnuts	1 3	0 9	0 8	0 6	0 5	0 4
Flanches	1 9	1 6	1 3	1 0	0 9	
Syphons, 2 quart	15 0	14 0	13 6	13 0	12 0	
Ditto 1 quart	11 0	10 0	9 6	9 0	8 6	
Tongs or nippers, each pair	9 0	7 0	6 6	5 6	4 9	4 6
Elbow burners, per dozen	7 6	jet or batwing.				
Straight burners „	6 0	ditto.				

Stocks, dies, and taps, for 2 inch, 1½ inch, and 1¼ inch tubing ..... £8 10s. 0d. per set.
Ditto, do. and do. „ 1 „ ¾ „ and ½ „ „ ..... 5 5 0 „
Ditto, do. and do. „ ⅝ „ 2-8 „ and ¼ „ „ ..... 3 0 0 „

FREIGHTS, per Ton.

Coastwise—Newcastle.	s.	d.
Chatham & Roches.	8	0
Colchest. & Maldon	5	9
Cork	9	0
Dartmouth	7	1½
Devonport	7	6
Dover	5	9
Dublin	9	0
Exeter Quay	8	6
Faversham	5	9
Folkestone	6	0
Hastings	7	0
Ipswich	5	0
Jersey	8	6
London	5	6
Lowestoft	5	0
Lynn	5	6
Limerick	10	1½
Margate	6	0
Newhaven	6	6
Portsmouth	7	0
Plymouth	7	6
Rye	6	6
Southampton	7	7
Totnes	7	6
Teignmouth	7	3
Weymouth	7	3
Yarmouth	4	10½

Foreign.	s.	d.
Algiers	19	0
Amsterdam	8	6
Antwerp	8	0
Boulogne	7	6
Barcelona	18	6
Bordeaux	12	6
Calais	7	6
Caen	9	6
Cadiz	10	0
Cette	17	0
Dieppe	7	6
Genoa	18	0
Hamburg	7	9
Havre	9	0
Honfleur	9	0
Leghorn	18	0
Lisbon	12	0
Marseilles	16	0
Nantes	14	0
Naples	19	0
Rotterdam	7	9
Rouen	11	6
Toulon	18	0
Trieste	20	0
Venice	24	0